

# THE ILLUSTRATED LONDON NEWS

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SATURDAY, JUNE 10, 1939.



## THE R.A.F.'S POWER TO STRIKE BACK AT AN AGGRESSOR: BRISTOL "BLENHEIM" BOMBERS IN A PRACTICE RAID.

It is difficult for the uninstructed to form an adequate conception of the enormous increase in the power of the Royal Air Force that is now going on. Official statements are kept vague—for obvious reasons; and the R.A.F. does not much go in for record-breaking and similar forms of publicity, except where these have a direct practical utility. Yet the expansion of the R.A.F. is

proceeding at a terrific rate, already promising to outstrip its schedules in many departments. Great strides forward have been made in the design and quantity production of new machines; tens of thousands of new men are being trained. No one can study the illustrations in this issue and fail to realise that the R.A.F. is on the high road to making Britain invincible in the air. (L.N.A.)





By ARTHUR BRYANT.

*PER ardua ad astra!* How long ago it seems, how much in another world the daily round, how lost, as though they had never been, most of the companions of that inconceivable experience. Twenty-two years ago—rather more—the writer of these lines, aspiring to leave school and enter the Army, then engaged in battle, rather sooner than would otherwise have been possible, applied for a commission in the old Royal Flying Corps. At that time he knew no more of an aeroplane than a cow does of a type-writer. His idea was that, having a taste for map-reading, he would make a tolerable observer, and that he might as well be of use to his country in that capacity as in any other. Even if he was not, he would get away the earlier from school.

Of course, when he found himself in the Royal Flying Corps his preconceived ideas about it and his own part in it quickly came to nothing. There was little map-reading to be done, though, as a gentleman cadet, a great deal more drills, which at the time seemed curious. It was his part, he found, to form fours, to keep his boots polished and his equipment bright, to take his turn on guard and as sentry at night in the roadway outside the camp. There were, in a minor way, plenty of hardships and scarcely a hint as yet of the stars. But what at least seemed certain was that, should the day of apprenticeship ever end, the thing to be was not an observer, but a pilot. Not to be flown by someone else, but to fly oneself. For, though in the German Air Force the pilot had first begun as a kind of super-chauffeur and the place of commissioned honour had been the observer's—a mistake subsequently rectified—in the R.F.C. from the very first the tradition had been the other way. The man who flew the machine was the man who mattered. So a pilot I became: I fear there can seldom have been a worse. But the experience was something one would not have missed for much gold, and the honour of having served, however inadequately, in those early days of a great institution is a thing to look back on with pride and gratitude. At forty it gives me something of a centenarian's dubious thrill to recall that I learnt to fly perched in the projecting cockpit of a Maurice Farman—the old "Rumpety" that could not be looped or stalled without imminent, if not certain, danger of disintegration in mid-air, and whose undercarriage was so intricate a contraption of intersecting wires that it was known as the bird cage. One could always discover, it was said, whether the latter had been slightly damaged by placing a canary inside and seeing if it could find its way out.

I have been reminded of those far days recently by reading a pilot's diary, written by a young squadron-leader of the Royal Air Force, named Frank Tredrey. I imagine from his name he must be a Cornishman, but it is the kind of book to make any Englishman proud. All unconsciously—at least, if it is conscious,

he is a fine artist—he conveys the sense of a great service, rich in tradition and strong in the passionate pride of its members in their craft and community. After reading it, it is almost impossible to believe that the service, reckoned in years, has only just attained its majority. It is so young that the dew still seems to rest on its wings of the morning. Yet it is old in knowledge—a peculiar knowledge of its own—and wisdom born of that knowledge. The distinguishing trait of its members is that, for all their many superficial differences, they are all consumed by a passionate—there is no other word that quite

in Israel, predicted something like it in his story, "The Night Mail." His conception has taken on a reality more wonderful than his conceiving: nature—as usual—has outstripped art. "We endeavour to keep the nose up by applying top rudder. This is our yawing couple and—she spins." And as you say it she suddenly woofs over the top without any warning and goes slap into a really tight and beautiful spin with engine on." There is a certain way of approaching the aerodrome to land which is known in the Service as "coming in like a bat out of hell." Around this new Service, which is so concerned with the technique of a mechanical science which one would have thought had little to do with tradition, has already grown up a formalism and an etiquette that reminds one of nothing so much as the Brigade of Guards. A job which requires the perfection of absolute mastery can best be performed, it has been found, by men who, in all they do, act with precision, method, and a sense of flawless quality. The word "style" best describes the atmosphere of a good R.A.F. squadron—something that permeates its every formality, even when it is taking it easy in the mess or in the carefully tended garden outside.

"Join the R.A.F. and see the world" was the slogan of the old recruiting poster. And, through all its ups and downs the R.A.F. has offered a wonderful way for a young man to see the world while he is learning his trade and serving abroad with the squadrons. Egypt—with its great flats the easiest school of aviation in the world—Aden, Iraq, the North-West Frontier, Burmah: here is God's plenty for a young man of spirit who wishes to earn his daily bread in the air. He serves England by distant rivers and palms and in the sight of far snows towering over eternal deserts. When he returns once more to his country it is to an England which has taken on new significance from his wandering. He has learnt to see things in a truer perspective than is possible for most Englishmen of his age.

Perhaps this accounts for a certain sweep and vision in the attitude towards the world which I have observed in my acquaintances in the Royal Air Force. After a long period in the wilderness of civic economy and neglect, they have come during the past year or so into their own, as the ever-increasing drone of fighting aeroplanes over my own quiet and remote roof-top now tells me daily and nightly. If foolish mankind should slide into the abyss of war and they be put to the test these young adventurers would, I believe, astonish the world. "What a life!" one of them writes, "cruising round above this summer earth in a flying machine all the afternoon for a living! While the poor termites toil in shop and factory and on dust-weary roads for their daily bread. I wouldn't join them for all the Crown jewels with the Crown lands chucked in!"

THIS special number of "The Illustrated London News," coming in the year in which the Royal Air Force has celebrated its twenty-first anniversary as a separate Service, is a timely acknowledgment of the growing importance of the air, both as a factor in our national security, and as an element of the everyday life of the British Commonwealth.

In all but the spirit by which it has been known throughout its twenty-one years' existence the Royal Air Force has been virtually transformed since expansion began four years ago. The numbers both of men and aircraft have grown to match the increasing responsibilities of air defence. Strengths of officers and airmen have been almost quadrupled, new classes of personnel have been called into being, and new training systems inaugurated. The balloon barrage of the Auxiliary Air Force has been created for the better defence of the Metropolis and other areas, and the R.A.F. Volunteer Reserve has been developed to strengthen the reserves behind the regular squadrons. In these volunteers of the air we have a keen and efficient reserve, which is rapidly increasing.

Many new squadrons have already been formed, and others are in prospect, and in addition the strengths of the squadrons have been increased. These measures have given us the means considerably to strengthen our air defence both at home and overseas. Both the new squadrons and the older ones are being rapidly equipped with aircraft which, in speed, range and fighting power, are second to none in the world.

This is a mechanical age, and it is natural that a great part of the public interest in Britain's air rearmament should be focussed on production. I am not able to say, for national reasons, how many new aircraft we are now producing, but I can say that our expectations, high though they were, have been more than realised. We are now getting an output of aircraft four times greater than a short while ago. One indication of all that is happening is that we are spending this year on aircraft and engines some £93,000,000, against £6,000,000 before expansion began. Besides this expenditure on aircraft we have for some time past set aside several millions for the erection and extension of aircraft factories. One such factory has been erected to produce an initial order of one thousand fighters of advanced design. In addition we have put into operation a vast sub-contracting system capable of large-scale production, and of an even larger potential in the case of need. We are continuing all these measures to increase our production capacity.

Besides these and other measures for increasing our own production of aircraft and equipment, the foundations of an alternative supply have lately been laid in the Dominions overseas. Bombers and fighters are being constructed in Canada, and Australia is also preparing to become a valuable source of aircraft supply.

Side by side with our progress in aircraft production there has been a splendid response to our recruiting needs. I am anxious that that progress should continue, in particular as regards to the air and ground sections of the R.A.F. Volunteer Reserve. With both our personnel and equipment needs thus placed on a sound basis, we are securing a strong and balanced Air Force which is one of our best guarantees for the maintenance of peace to-day.

*Kingsley Wood*

A FOREWORD BY SIR KINGSLEY WOOD, M.P., SECRETARY OF STATE FOR AIR,  
TO "THE ILLUSTRATED LONDON NEWS" SPECIAL R.A.F. NUMBER.

describes it—desire to master their craft. Theirs is a wonderful technical skill, born of little more than a quarter of a century's practice, but with how much of breathless experience and daring, momentous experiment crowded into it. With it has grown up a wonderful jargon like nothing else on earth, except the jargon of Englishmen who have mastered a job and turned their mastery, after the ancient manner of the English, into a corporate privilege. Thirty or more years ago Rudyard Kipling, who was something of a prophet

and nightly. If foolish mankind should slide into the abyss of war and they be put to the test these young adventurers would, I believe, astonish the world. "What a life!" one of them writes, "cruising round above this summer earth in a flying machine all the afternoon for a living! While the poor termites toil in shop and factory and on dust-weary roads for their daily bread. I wouldn't join them for all the Crown jewels with the Crown lands chucked in!"

N.B.—Owing to the fact that this issue is a special Royal Air Force Number, and is therefore mainly devoted to that subject, several of our regular page features will be found on later pages than usual: "The World of the Kinema" is on pages 1072 and 1074; "Books of the Day" on pages 1076, 1078 and 1080; and "The World of Science" on pages 1088 and 1090.



THE MEN RESPONSIBLE FOR AIR DEFENCE  
IN GREAT BRITAIN AND THE EMPIRE.

SOME OF THE OUTSTANDING PERSONALITIES  
AT THE AIR COUNCIL AND AIR MINISTRY.



SIR ARTHUR STREET.  
Permanent Under-Secretary for Air.



AIR CHIEF MARSHAL SIR CYRIL L. N. NEWALL.  
Chief of the Air Staff and Senior Air Member of the Council.



AIR VICE-MARSHAL W. L. WELSH.  
Air Member for Supply and Organisation.



THE RT. HON. SIR KINGSLEY WOOD.  
Secretary of State for Air and President of the Air Council.



AIR VICE-MARSHAL H. R. NICHOLL.  
Air Officer Commanding Royal Air Force, Middle East.



AIR CHIEF MARSHAL SIR HUGH DOWDING.  
Commander-in-Chief of the Fighter Command.



AIR MARSHAL SIR F. W. BOWHILL.  
Commander-in-Chief of the Coastal Command.

THE Air Ministry, and through it the basic organisation of the R.A.F., is controlled through the Air Council, of which the President is the Secretary of State for Air. Since 1938 the Rt. Hon. Sir Kingsley Wood has held that post; formerly he was Minister of Health, 1935-38, and in 1931-35 Postmaster-General. The Chief of Air Staff, since 1937 Air Marshal Sir Cyril Newall, is responsible for policy and operations. Sir Cyril transferred to the R.A.F. in 1919 after a distinguished military career. Since 1937 the Air Member for Supply and Organisation has been Air Vice-Marshal W. L. Welsh, previously

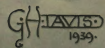
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Director of Organisation, Air Ministry. Sir Arthur Street, Permanent Under-Secretary for Air, succeeded Colonel Sir Donald Banks early in 1939. Subsidiary to the Air Council are the R.A.F. Commands. The Commander-in-Chief of the Fighter Command, Air Chief Marshal Sir Hugh Dowding, is also in charge of such defensive forces as balloon barrages. Air Marshal Sir F. W. Bowhill, Commander-in-Chief of the Coastal Command, controls the Reconnaissance Group and the Special Training Group. Air Vice-Marshal Nicholl has been the Officer Commanding the Royal Air Force, Middle East, since 1938.

Photographs by Lafayette, Elliott and Fry, Russell, Howard Coster, and Vandyk.



DRAWN BY OUR SPECIAL ARTIST, G. H. DAVIS. WITH THE ASSISTANCE OF THE AIR MINISTRY



slower development; and owing to the fact that the speed of the newest two-seater fighter, the "Defiant," has not yet been officially divulged, it is impossible to make a comparison. Medium bombers are also rapidly increasing in all-round efficiency, and in the "Blenheim," "Hampton," and "Wellington" we have three types which are among the fastest and most powerful of their class in the world. In the last war our heavy bombers attacked enemy strong points and aerodromes travelling at a speed of about 90 to 100 m.p.h.; to-day our latest "heavy" bomber, the Armstrong-Whitworth "Whitley IV," does 245 m.p.h. In the twenty-one years engines have

advanced enormously, not only in power—from 370 h.p. in 1918 to 1030 h.p. to-day—but in reliability. The rotary engine that propelled most of our single-seater fighters in the war has quite disappeared. In this, it will be remembered, the cylinders spun round on a fixed shaft. To-day, the majority of our air-cooled engines are of the inline type, with the cylinders in a row and the pistons driven by a central shaft. The fighting power of our single-seater fighters has gone up from the two fixed Vickers guns of the "Snipe" to the eight Brownings of the "Hurricane" and the "Spitfire." The undercarriages now retract to decrease the drag, and the "cleaning-up" of the fuselages has also enormously decreased this drag. Finally, it is noticeable that the monoplane is now general, and all our latest types of fighting aircraft have made the transition from biplane to monoplane. The "Hurricane" and the "Spitfire" are the famous heavy bomber, the Vickers "Vimy," was the type of machine that first flew the North Atlantic. It was also the first to fly to Australia in 1919. It is highly probable that the light bomber, which had not been developed since the war, will be developed very soon.



## EARLY TYPES OF MILITARY AIRCRAFT:

ROYAL FLYING CORPS MACHINES USED  
BETWEEN 1914 AND 1918.

(Imperial War Museum photographs. Copyright Reserved.)



BLÉRIOT MONOPLANE (1914)



HENRI FARMAN PUSHER BIPLANE (1914-1915)



MAURICE FARMAN SHORTHORN TWO-SEATER (1914-1915)



AVRO 504 K BIPLANE (1914-1915)



BRISTOL SCOUT (1915-1916)



DE HAVILLAND 2 (D.H. 2) SINGLE-SEATER (1916)



F.E.2b (FARMAN EXPERIMENTAL 2b) PUSHER (1915-1916)



B.E. 2c (1915)



SOPWITH TRIPLANE (1917-1918)



NIEUPORT SCOUT (1915-1917)



MORANE PARASOL MONOPLANE (1916)



SOPWITH "CAMEL" SINGLE SEATER (1917-1918)



R.E. 8 (1917-1918)



S.E.5a SINGLE-SEATER (1917-1918)



SPAD SINGLE-SEATER (1917-1918)



DE HAVILLAND (D.H.4) TWO-SEATER, FIGHTER AND BOMBER (1917-1918)

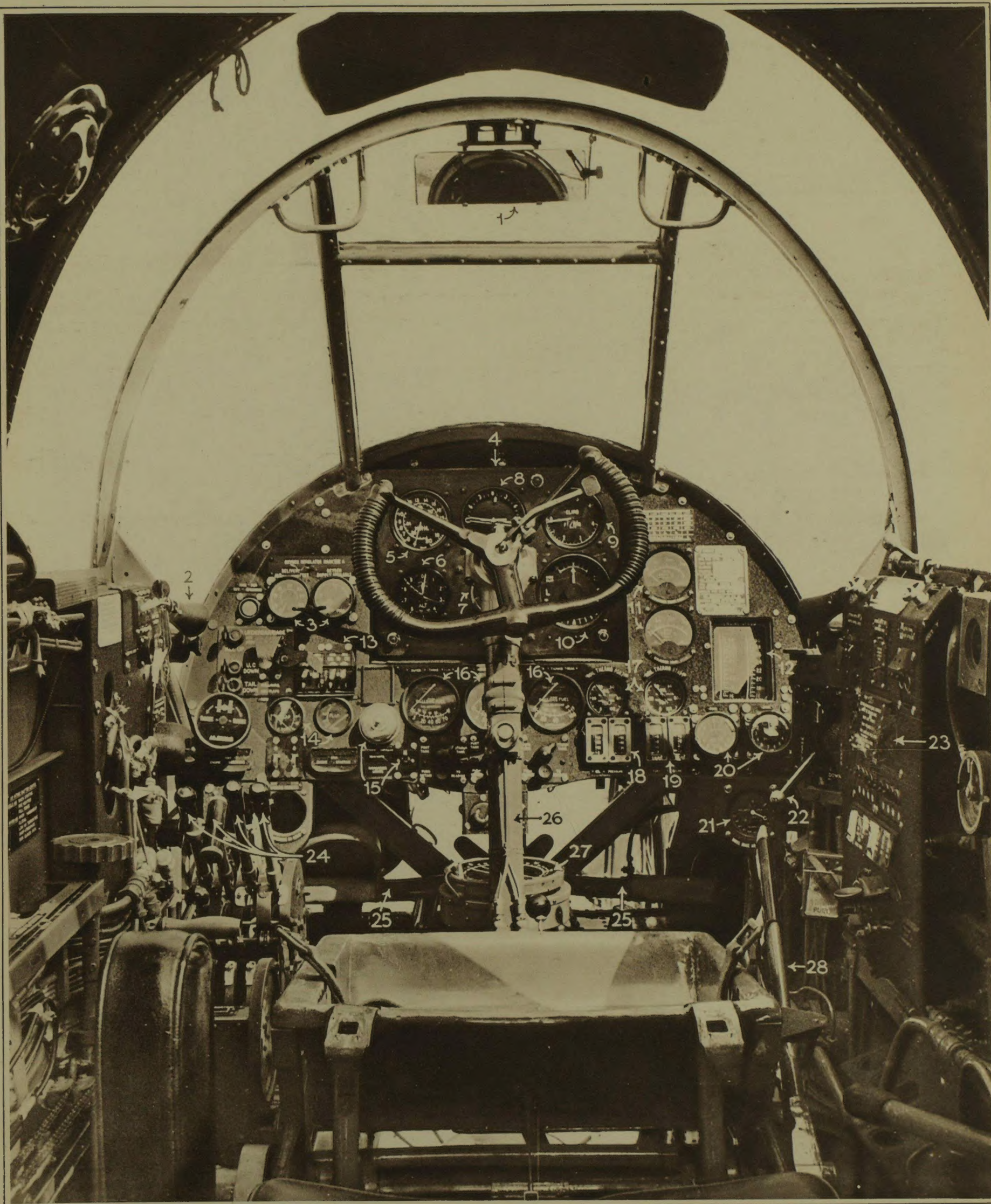
of military aircraft since the Royal Air Force was formed twenty-one years ago is not generally understood, but if the photographs on this page are compared with others in this issue it will be realised that the youngest of the Services has developed at an astounding rate. At the end of the war the R.A.F. was composed of 187 squadrons comprising 3300 machines, 30,000 officers and 264,000 men, but by 1923 there were only 36 squadrons with 3000 officers and 27,500 men. These figures have gradually improved and now the R.A.F. is rapidly approaching its former strength. The machines available for the Royal Flying Corps in 1914 included the Blériot monoplane, with a 50-h.p. Gnome engine; the Henri Farman pusher biplane, with a 80-h.p. long-stroke Gnome engine; the Maurice Farman Shorthorn two-seater, with a 70-h.p. air-cooled Renault engine; and the Avro 504 K biplane, with an 80-h.p.

The amazing progress which has been made in the design

Gnome engine, which was used on the Western Front and for training at home. In 1915 the Bristol Scout, with an 80-h.p. Le Rhône engine, became available. It was a single-seater fighter of excellent performance. The F.E.2b Pusher, powered with a 120-h.p. or 160-h.p. Beardmore engine, made its appearance in the same year as a day fighter, and later was used as a short-range night bomber. The B.E.2c, powered with a 90-h.p. air-cooled Raf engine, was the standard Corps Artillery Reconnaissance aircraft of 1915-16. One of the most successful aeroplanes which appeared in 1916 was the single-seater De Havilland 2, with a 100-h.p. Gnome Monosoupape engine. It largely contributed to the defeat of the Fokker monoplane. In 1917 appeared the Sopwith "Camel," with a 130-h.p. Clerget engine, and the Spad, powered with a 150-h.p. Hispano-Suiza engine—both were prominent fighters fitted with synchronised Vickers guns.



## A BOMBER'S FLYING CONTROLS: THE PILOT'S COCKPIT OF A "HAMPDEN."



DETAILS OF THE DASHBOARD AND CONTROLS OF A HANDLEY PAGE TWIN-ENGINE "HAMPDEN" BOMBER.

1. Rear view reflector mirror. 2. Dashboard light. 3. Oxygen regulator. 4. Instrument flying panel. 5. Air-speed indicator. 6. Sensitive altimeter. 7. Direction indicator. 8. Artificial horizon. 9. Rate of climb indicator. 10. Turning indicator. 11. Engine-cylinder thermometers (port and starboard). 12. Engine-speed indicators (electrical). 13. Undercarriage position indicator and switches.

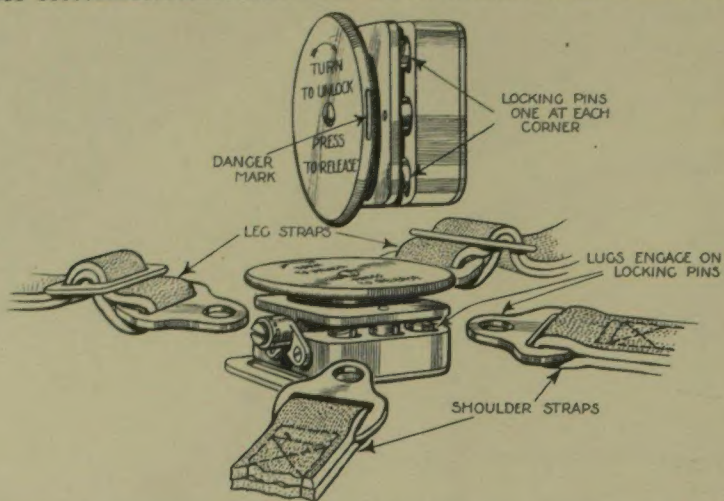
The pilot of a modern bomber has a very crowded instrument panel to watch during flight and when landing for the adoption of flaps, slotted wings, retractable undercarriages, and other devices has necessitated a corresponding increase in gauges and indicators. Our photograph shows the cockpit of a Handley Page "Hampden" twin-engine bomber which is powered with two Bristol "Pegasus XVIII." engines, and was designed to form a link in size between the "Blenheim" and the big

14. Flap position indicators (port and starboard). 15. Switches. 16. Fuel-contents gauges. 17. Engine-oil temperature thermometers. 18. Engine-oil pressure-gauges. 19. Fuel pressure-gauges. 20. Engine-boost gauges. 21. Brake air-pressure gauge. 22. Retractable undercarriage control. 23. Wireless panel. 24. Engine controls. 25. Rudder-bar. 26. Control column. 27. Compass. 28. Lever for adjusting pilot's seat.

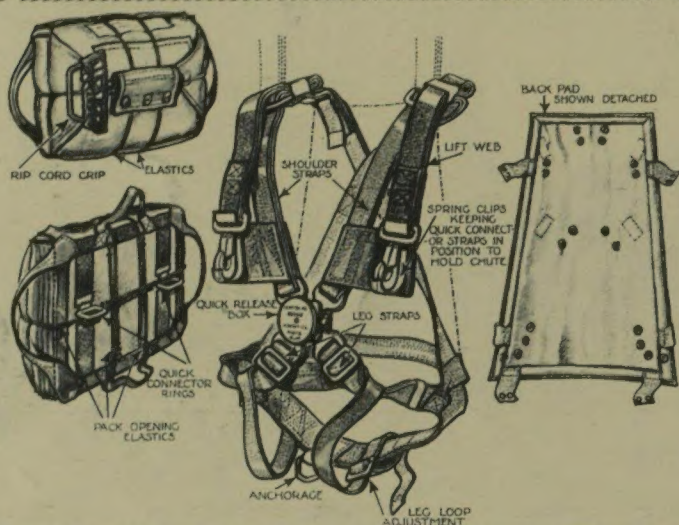
bombers. It has a maximum speed of 265 m.p.h. and a range of 1790 miles. The "Hampden" has been in quantity production for the R.A.F. for some months, and is unique among British multi-engine bombers in that three of its guns are fired from manually-operated mountings instead of power-driven turrets, while the fourth is fixed and fires through a port in the nose. The rear portion of the fuselage is distinctive and takes the form of a boom for carrying the tail. (L.N.A.)



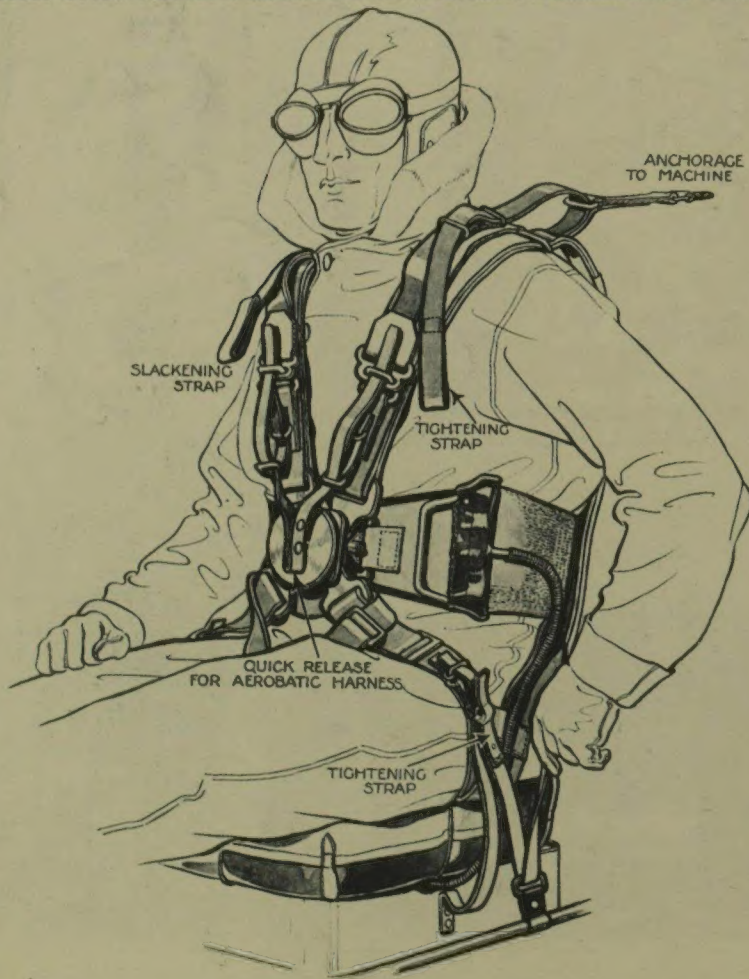
# THE AIRMAN'S LIFEBELT: PARACHUTES AS A SAFETY FACTOR IN FLYING.



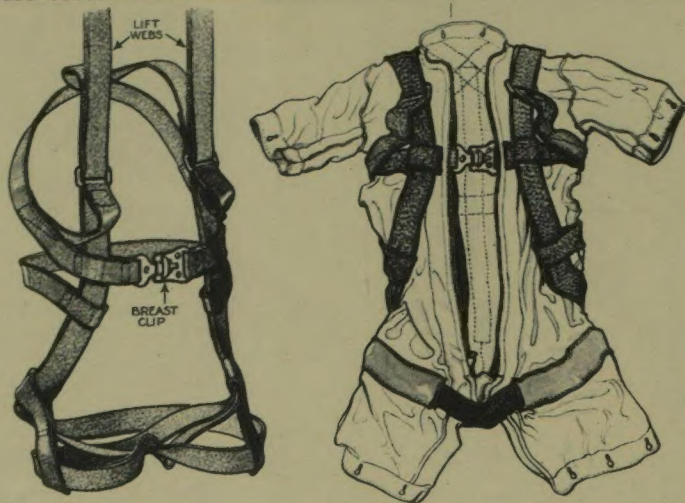
THE IRVIN QUICK-RELEASE USED ON SERVICE PARACHUTES: A DEVICE WHICH FREES THE AIRMAN COMPLETELY OF THE PARACHUTE ON LANDING.



WIDELY USED ESPECIALLY BY AIR GUNNERS: THE IRVIN "QUICK-CONNECTOR" HARNESS TO WHICH THE PACK CAN BE QUICKLY ATTACHED.



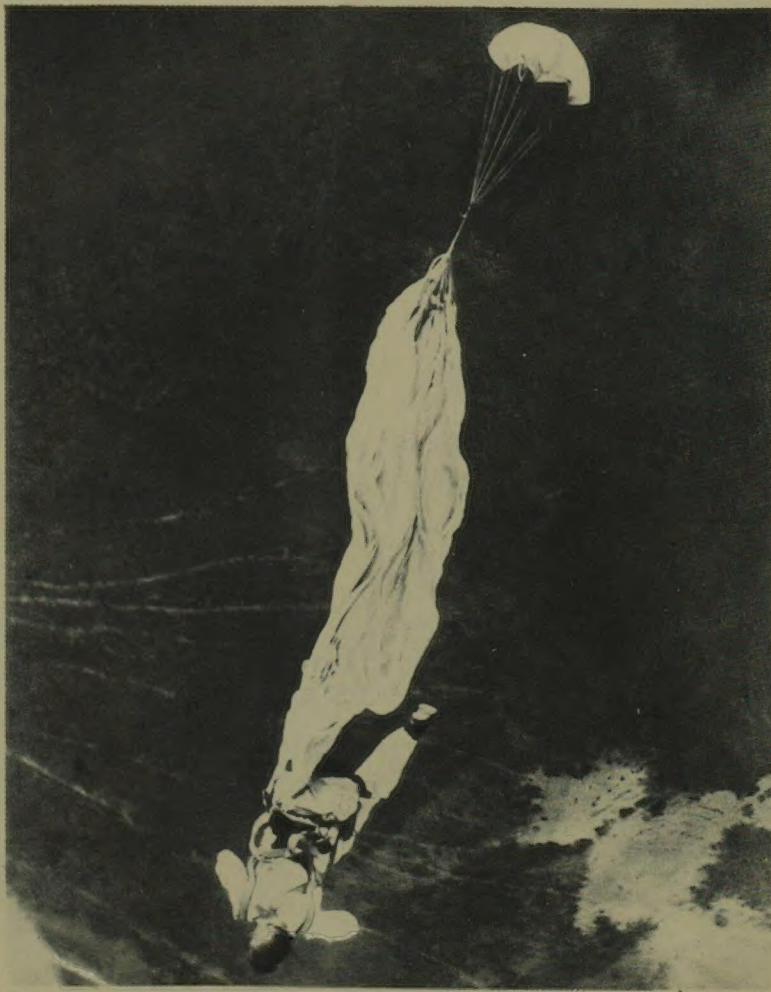
THE IRVIN "SAFETY-BELT" HARNESS; SHOWING HOW SIMPLE IT IS FOR THE WEARER TO RELEASE HIMSELF FROM HIS ACCOUTREMENTS.



THE "PARASUIT": A METHOD WHEREBY THE PARACHUTE HARNESS IS EMBODIED IN THE DETACHABLE LINING OF A FLYING-SUIT.



AN IRVIN AIR CHUTE OPENING JUST AFTER THE RIP-CORD HAD BEEN PULLED: A STRIKING "SPLIT-SECOND" PHOTOGRAPH.



IN HEADLONG DESCENT: A REMARKABLE ACTION PHOTOGRAPH SHOWING HOW THE PILOT PARACHUTE PULLS THE CANOPY AWAY FROM THE AIRMAN'S BODY. Melbourne "Argus."

The parachute has with reason been called the airman's lifebelt, for the famous "Caterpillar Club," whose members are those whose lives have been saved in an emergency by an Irvin Air Chute, already has a strength of over 1500. These parachutes are made by the Irving Airchute of Great Britain, Ltd., and are the standard equipment for the air forces of the British Empire. A feature of the "Irvin" is the quick-release which has been adopted throughout the

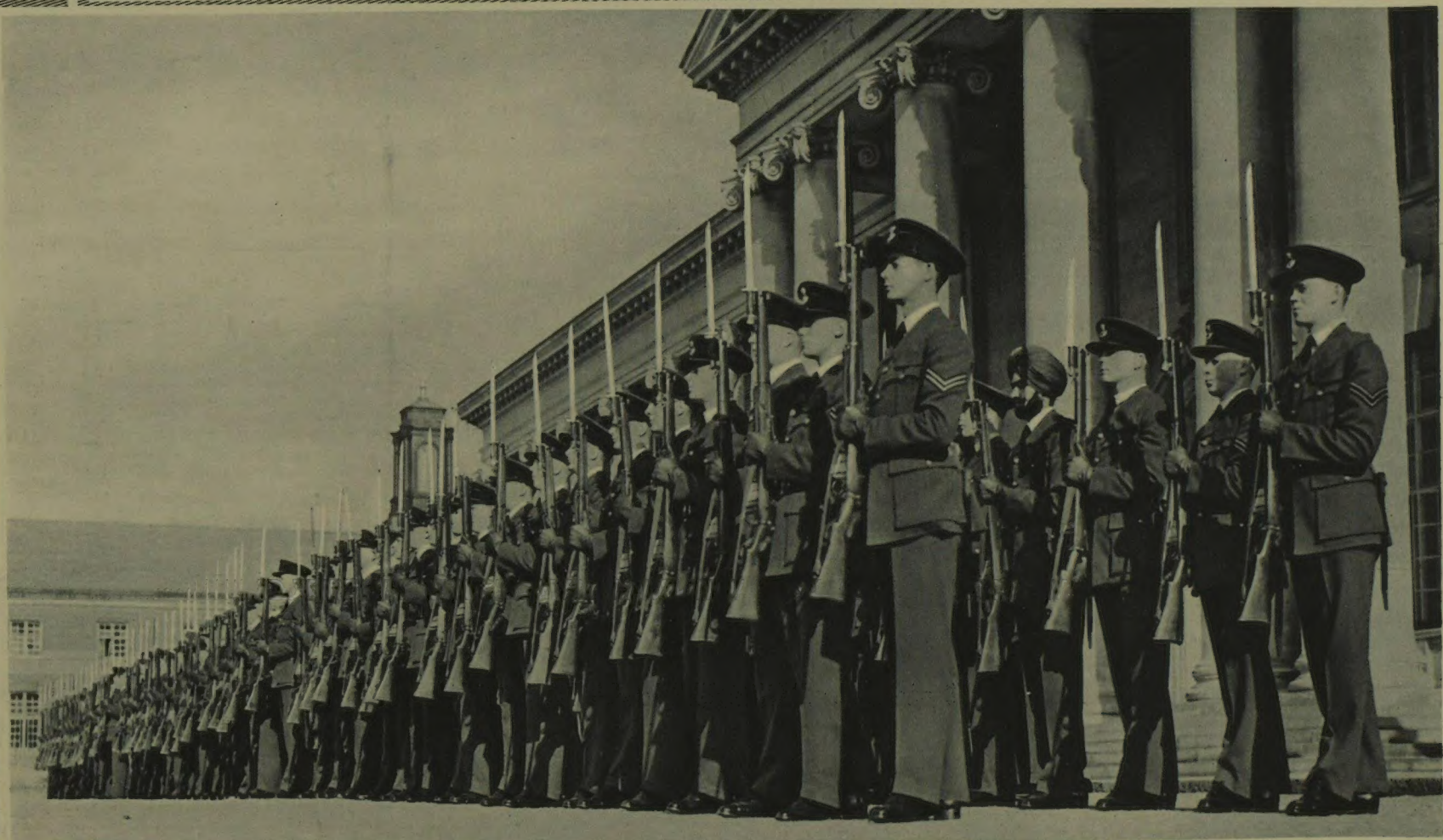
R.A.F. It is unlocked by turning a large press-button and the wearer is freed of the parachute by pressing the button. There are various types of parachutes in use, the "quick-connector" pack being widely employed for air-gunnery as it can be detached from the harness, giving increased freedom of movement. The "Parasuit" is made by the G. Q. Parachute Co., Ltd. The harness is embodied in the detachable lining of a flying-suit (Drawings by Courtesy of "Flight.")



# CRANWELL—THE TRAINING COLLEGE FOR FUTURE R.A.F. OFFICERS.



TRAINING FUTURE R.A.F. OFFICERS AT CRANWELL COLLEGE, LINCOLNSHIRE: MARCHING TO A CEREMONIAL PARADE, WITH FIXED BAYONETS, IN FRONT OF THE MAIN BUILDING.



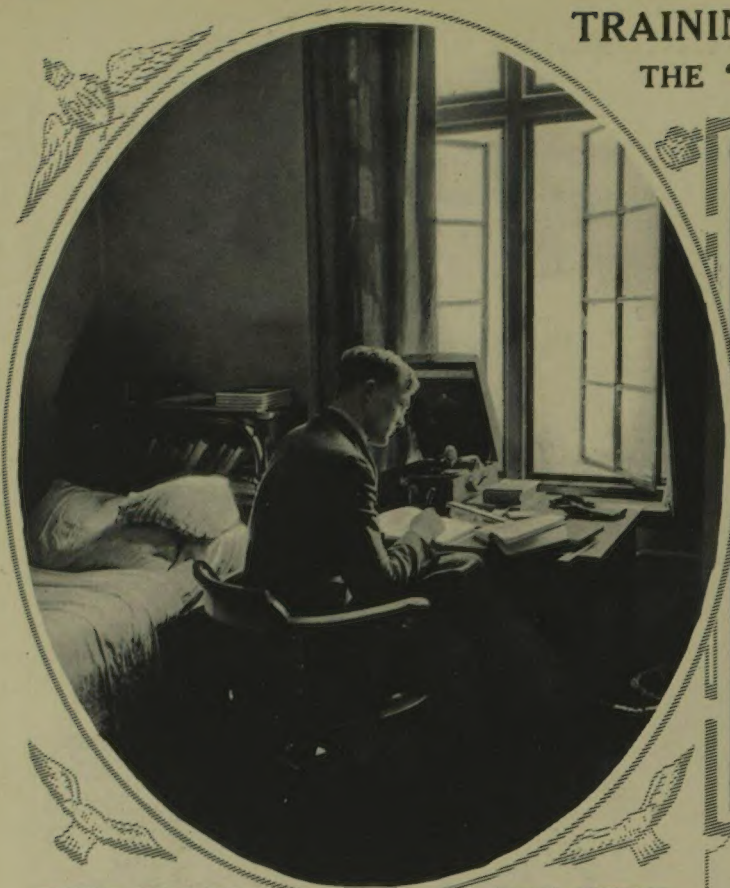
FUTURE PILOTS DISPLAYING THEIR PROFICIENCY IN SMALL ARMS DRILL: TWO RANKS OF PERFECTLY ALIGNED RIFLES HELD AT THE "PRESENT."

As machines get faster and faster and their equipment more and more complicated, the training of the personnel becomes an increasingly elaborate task. Entry into the permanent commissioned ranks of the General Duties (Flying) Branch of the Royal Air Force is by the R.A.F. Cadet College at Cranwell, Lincolnshire, though University candidates may enter direct. Entrance to the Cadet College is normally by examination, and by the award of King's Cadetships and Honorary King's

Cadetships. These cadetships are offered to the sons of officers of H.M. Forces who have died in the King's service; and to the sons of R.A.F. officers who have reached the rank of Squadron Leader or higher. The Cranwell training is for two years. The period includes an intensive course of general education and Service training. A general conspectus of the work of the College is given in the photographs on this and the following pages. (Photographs, Central Press.)

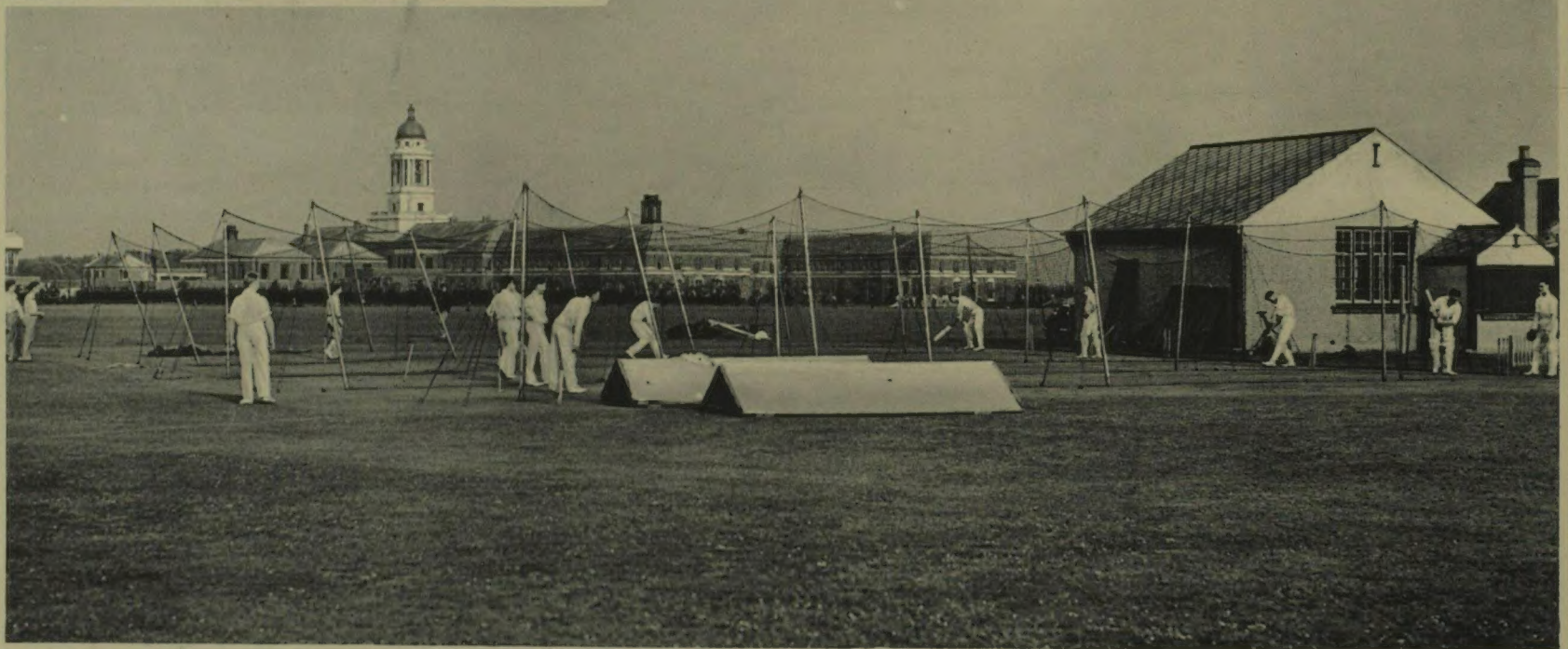


# TRAINING FUTURE R.A.F. OFFICERS AT CRANWELL: THE "PRIVATE LIFE" AND PHYSICAL WELFARE OF THE CADET.



A PERIOD OF RELAXATION: A GROUP OF CADETS READING THE PAPERS IN THE ANTE-ROOM AT CRANWELL.

THE "PRIVATE LIFE" OF THE CADET AT CRANWELL: A FUTURE OFFICER WRITING IN HIS OWN ROOM, AMONG HIS PERSONAL BELONGINGS, WHICH INCLUDE A GRAMOPHONE.



CRICKET, WHICH HAS PROVED A FINE SCHOOL OF NATIONAL CHARACTER IN THE PAST, STILL FINDS FAVOUR WITH THE PUPILS OF THE NEW ART OF WAR: NET PRACTICE.



TENNIS, PROVIDING EXCELLENT EXERCISE FOR QUICKNESS OF EYE AND MUSCULAR CORRELATION: PUPILS WITH THE PROFESSIONAL COACH.



KEEPING UP THE HIGH STATE OF PHYSICAL FITNESS NEEDFUL IN AN EFFICIENT PILOT: A SQUAD AT TRAINING IN THE OPEN.

The training at Cranwell is designed to fit the Flight Cadet to take his place as an operational pilot in a Service squadron; to have a knowledge of the duties appropriate to a junior officer; and to lay the foundation which will enable an officer to prepare himself for the Royal Air Force Staff College. The course lasts

two years. Each year is divided into three terms, lasting thirteen-and-a-half weeks. A day's work is organised in periods of three-quarters of an hour, and a week's work amounts to thirty-two hours. The subjects studied in the first year are: English; world history, with special reference to the British Empire;

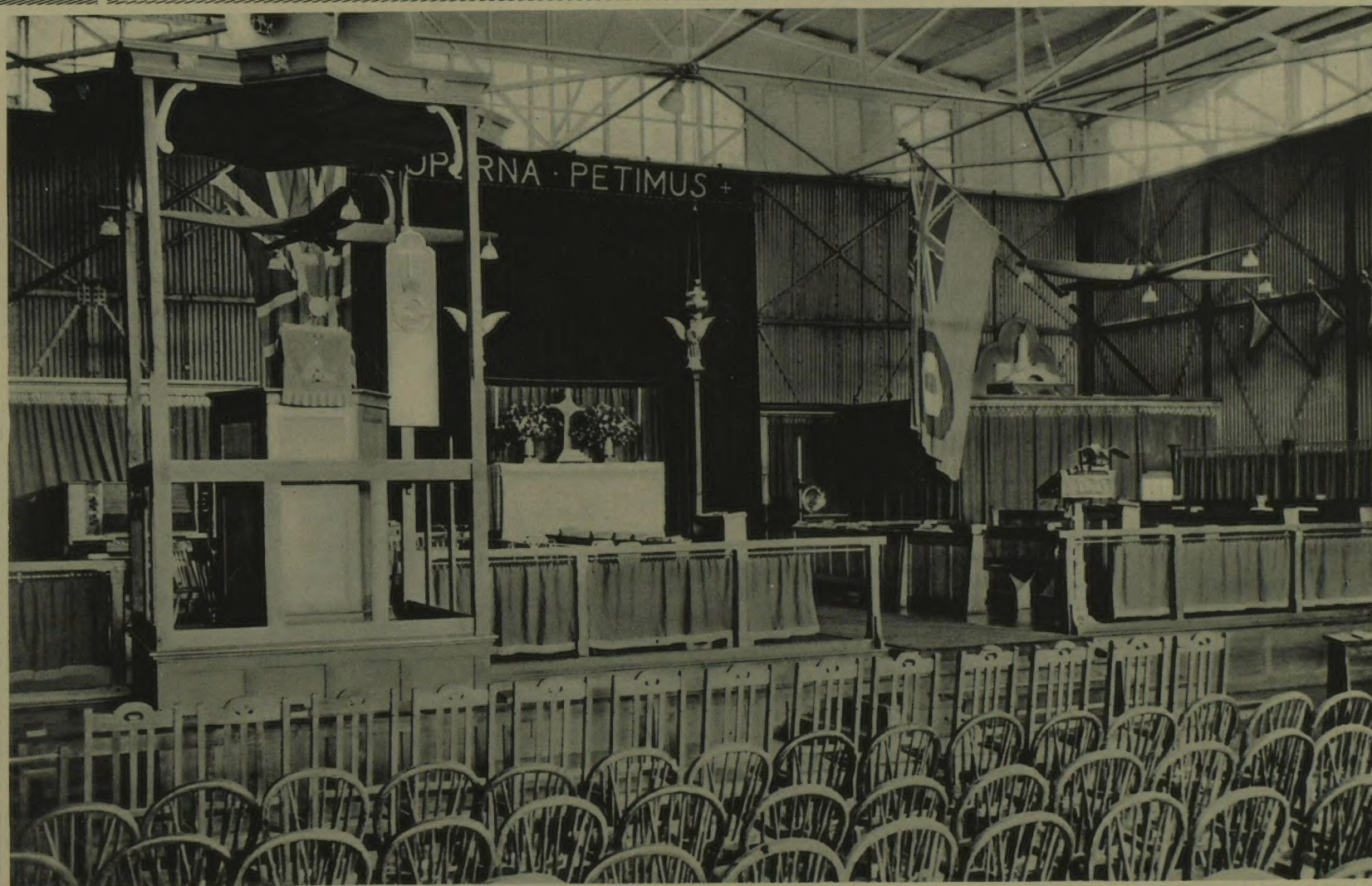
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## COMMUNITY LIFE AT CRANWELL: DINING-ROOM; AND CHAPEL.



LUNCH IN THE DINING-ROOM AT CRANWELL: THE ASSEMBLED CADETS INCLUDING A NUMBER WEARING THE PILOT'S WINGS UPON THEIR TUNICS; AND SOME INDIAN CADETS.



THE CHAPEL: A CONVERTED HANGAR (USED FOR AIRSHIPS DURING THE WAR) IN WHICH AIR FORCE SYMBOLISM IS MUCH EVIDENT, AND PROPELLERS ARE USED FOR ORNAMENTS, THE ALTAR CROSS BEING IN THE SHAPE OF A TRUNCATED ONE.

*Continued*. aerodynamics; mathematics; mechanics; the theory of heat engines; mechanical drawing; the construction of engines, including practical work on engines and the use of tools; elementary air navigation; airmanship; armament; sending and receiving by the Morse code. The second year is devoted more to purely

professional work. The subjects studied are: Advanced navigation; armament; maintenance of airframes and engines and flight routine; meteorology; signals; law and administration; accounts; sanitation and hygiene; and the organisation and employment of the Navy, Army and Air Force. (Photographs, Central Press.)



WORKSHOP, ARMAMENT AND METEOROLOGICAL TRAINING AT CRANWELL.



METALLURGY: A LESSON IN REPAIRING AND PATCHING THE METAL HULL OF A FLYING-BOAT—ALREADY COVERED WITH NUMEROUS PATCHES.



AIRCRAFT REPAIRS: CADETS IN THE WORKSHOPS, OPERATING A VARIETY OF TOOLS UNDER THE EYE OF AN INSTRUCTOR.



ARMOURER'S WORK: INSTRUCTION IN THE MECHANISM OF A MACHINE-GUN, WHICH A CADET IS TAKING TO PIECES.



LEARNING AERIAL GUNNERY: A GROUP OF CADETS PRACTISING AIMING AN AUTOMATIC AT AN AERIAL TARGET FROM A DUMMY COCKPIT.



METEOROLOGY: STUDYING THE METHOD OF MEASURING THE SPEED AND DIRECTION OF WINDS WITH BALLOONS AND A THEODOLITE.



RECORDING THE PATH OF THE METEOROLOGICAL BALLOON AFTER IT HAS BEEN RELEASED, BY MEANS OF THE THEODOLITE.

Cranwell College is divided into three squadrons of Flight Cadets, each squadron being commanded by an officer who has to assist him, a Flight Cadet Under-Officer and four Flight Cadet non-commissioned officers. The period of training is two years, which is divided into six terms. All Cadets begin their flying

training on the elementary training type of aircraft within the first few days of their arrival at the College. During the first term the Cadet is taught to fly an elementary training type; for the remainder of his first year he flies single- and twin-engined Service types. He passes to the Advanced Training Squadron in

[Continued opposite.]



# INSTRUCTION IN RADIO, PHYSICS, THE MORSE CODE, AND ENGINEERING AT CRANWELL.



LEARNING THE PRINCIPLES OF WIRELESS COMMUNICATION AT CRANWELL:  
INSTRUCTION ON A SIMPLE TYPE OF CIRCUIT DISPLAYED ON A PANEL.



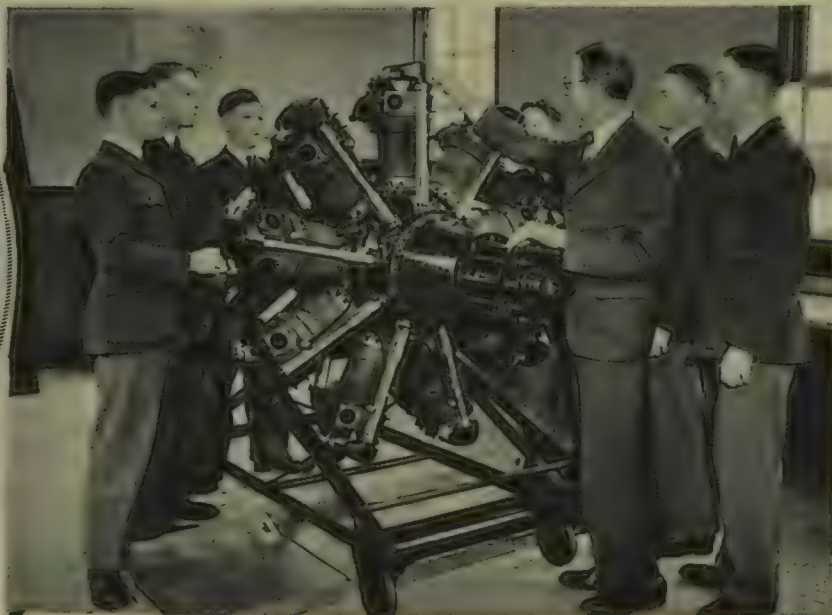
PRACTICAL PHYSICS: INSTRUCTION IN A CLASS-ROOM EQUIPPED WITH  
ELABORATE APPARATUS.



A LECTURE ON THE THEORY OF FLIGHT; THE CLASS-ROOM HUNG WITH AERODYNAMIC DIAGRAMS  
AND METALLURGICAL AND OTHER CHARTS.



ACQUIRING PROFICIENCY IN THE MORSE CODE, WHICH ALL HAVE TO LEARN:  
A CLASS ENGAGED IN WRITING DOWN "MESSAGES RECEIVED."



LEARNING ABOUT THE MODERN 'HIGH-POWER AERO ENGINE—THE SUBJECT  
IN THIS CASE BEING ONE OF THE FAMOUS BRISTOL "PEGASUS" SERIES.

*Continued.*  
his second year; here he is taught the theory and practice of bombing and air-firing, and the other aspects of Service flying. Night Flying Training is progressive throughout the two years. Certain Cadets of the Senior Term are chosen to be Under-Officers or non-commissioned officers. They are responsible for the general

conduct of the College routine. The object of this is to develop a sense of responsibility as well as the power to command men. Cadets have a choice of various sports, including rowing, in which they can take part. There is also a riding school, which is very popular. (Photographs, Central Press.)



ADVANCED TRAINING AT CRANWELL: CADET PILOTS TAKE TO THE AIR.



BEING INITIATED INTO THE GRIMMER SIDE OF THEIR VOCATION: CRANWELL CADETS IN FULL FLYING KIT RECEIVING INSTRUCTION ON A BOMB-SIGHT.



ADVANCED TRAINING: CADETS WHO HAVE GOT THEIR PILOT'S "WINGS" STUDYING BOMB-RELEASE MECHANISM.



PILOTS OF AIRSPEED "OXFORD" TWIN-ENGINE TRAINERS MAPPING OUT THEIR COURSE BEFORE GOING FOR A FLIGHT FROM CRANWELL.



THE CAMERA-GUN, WHICH RECORDS ON A FILM THE ACCURACY OF THE AIM TAKEN, BEING OPERATED FROM AN OBSERVER'S COCKPIT.



READY FOR A LESSON IN BLIND FLYING: THE CADET (LEFT) PULLING FORWARD THE HOOD WHICH COMPLETELY ENCLOSES THE COCKPIT.



NIGHT FLYING: A FINAL WORD OF ADVICE BEFORE A CADET PILOT STARTS OFF INTO THE DARKNESS.

At the end of his two years' course at Cranwell a Cadet is passed out to a permanent commission as a pilot officer in the R.A.F. A Sword of Honour is presented to the Flight-Cadet, who, on passing out, is recommended by the Commandant of the College as having most distinguished himself in study, sport and general influence while in residence at the College. When posted to their


squadrons, pilots are given special instruction on the type of aircraft with which the squadron is equipped before being allowed by the commanding officer to fly solo on that type. This practice is also followed when new-type aircraft are introduced into a squadron. By these means training is attended by the maximum possible degree of safety at every stage. (Photographs, Central Press.)



BOMBS AND BOMBING: MODERN R.A.F. METHODS AND TYPES OF PROJECTILE.


Drawn by our Special Artist G. H. Davis.

BOMBS ALL DRAWN TO THE SAME SCALE.



**PARACHUTE BOMBING ATTACK WITH PARACHUTE BOMBS.**

THE PARACHUTE RETARDS THE FALL OF THE BOMB SO THAT IT FALLS VERTICALLY ON ITS TARGET AND HAS A MAXIMUM BURSTING EFFECT. THE ARRESTED FALL ALSO ALLOWS THE AIRCRAFT TO GET CLEAR BEFORE THE BOMB EXPLODES.



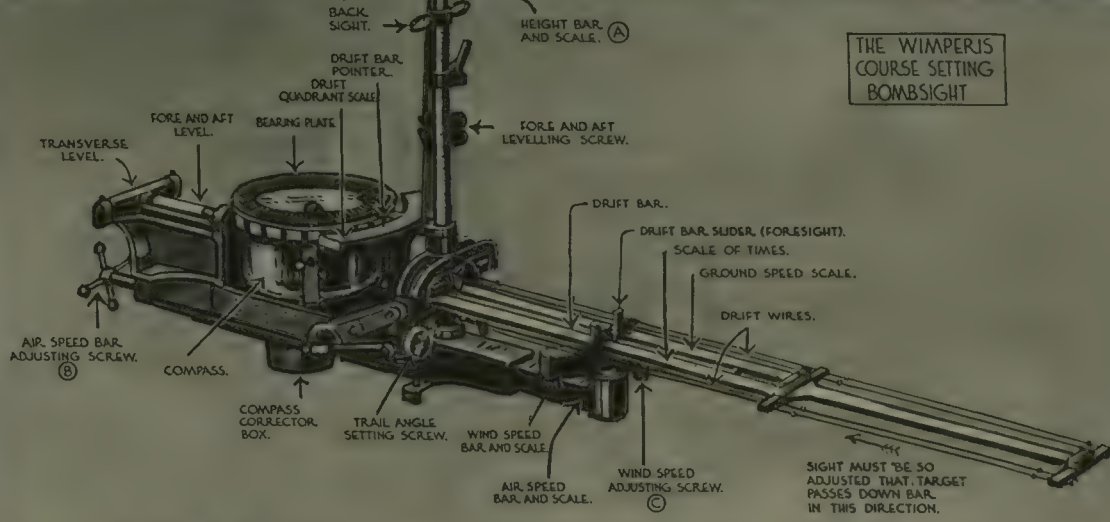
PATH OF DIVING BOMBER.

BOMBS RELEASED AT BOTTOM OF DIVE.

PATH OF FALLING BOMBS.

VERTICAL IMPACT.

**THE WIMPERIS COURSE SETTING BOMBSIGHT**

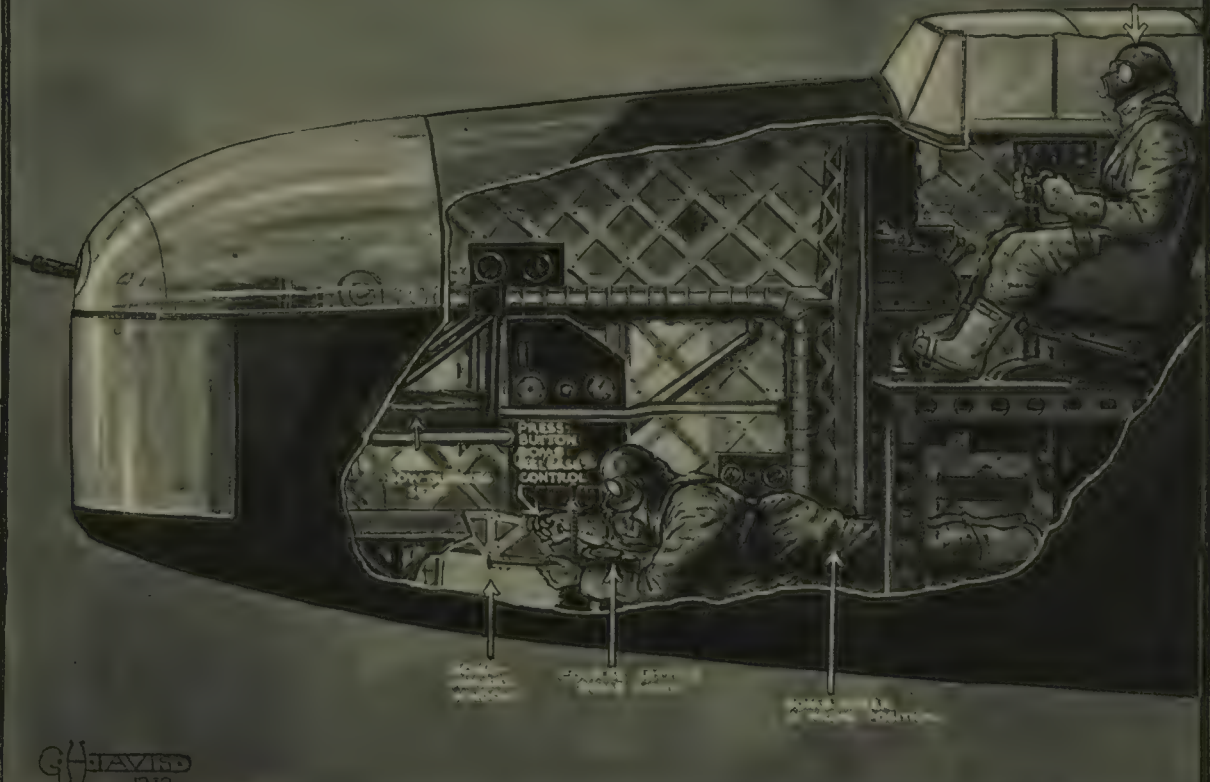


BACK SIGHT. HEIGHT BAR AND SCALE. DRIFT BAR POINTER. DRIFT QUADRANT SCALE. FORE AND AFT LEVEL. BEARING PLATE. TRANSVERSE LEVEL. AIR SPEED BAR ADJUSTING SCREW. COMPASS. COMPASS CORRECTOR BOX. TRAIL ANGLE SETTING SCREW. WIND SPEED BAR AND SCALE. WIND SPEED ADJUSTING SCREW. DRIFT BAR. DRIFT BAR SLIDER (FORESIGHT). SCALE OF TIMES. GROUND SPEED SCALE. DRIFT WIRES.

THE AIMER SETS HEIGHT OF AIRCRAFT ON SCALE (A) AND SPEED OF THE AIRCRAFT BY SCREW (B) WHICH BRINGS FORESIGHT FORWARD. BY ADJUSTING (C) ON WIND SPEED BAR, FORESIGHT IS MOVED TO CORRECT POSITION TO ALLOW FOR SPEED OF THE WIND, AND DRIFT BAR IS SET AT CORRECT ANGLE, ALLOWING FOR DRIFT. WHEN ALL IS CORRECTED AND THE SIGHTS ARE TRUE ON THE TARGET THE BOMBS ARE RELEASED.

SIGHT MUST BE SO ADJUSTED THAT TARGET PASSES DOWN BAR IN THIS DIRECTION.

**THE BOMB-AIMER AT HIS POST IN THE NOSE OF A MODERN VICKERS "WELLINGTON" BOMBER.**




PILOT.

PRESS BUTTON FOR BOMB RELEASE CONTROL.

**TYPES OF BOMBS**

CONTACT TYPE WHICH BURSTS ON IMPACT.




STEADYING VANES.


THIN CASE.

PROPORTION OF WEIGHT TAKEN UP BY EXPLOSIVE 20 PER CENT.

**ARMOUR PIERCING TYPE.** STRENGTHENING OF THE CASE REDUCES EXPLOSIVE CONTENT TO ABOUT 10 PER CENT.



**INCENDIARY BOMB.** THE 2 LB. MAGNESIUM TYPE. LENGTH: 14 IN. DIAMETER: 1 3/4 IN.



ALUMINIUM FINS AND FAIRING.

SOLID MAGNESIUM.

THERMITE.

DETONATOR.

THE AERIAL BOMBER AND HIS WEAPONS: THE WIMPERIS SIGHT USED IN THE R.A.F. IN CONJUNCTION WITH A PRESS-BUTTON BOMB-RELEASE TO ENSURE HITTING THE TARGET; AND OTHER METHODS OF BOMB ATTACK.

From those first days of aerial bombing during the Great War, when bombs of a very crude type were taken aloft and dropped haphazard over the side by hand, bombing to-day has become a very exact science, and the bomb-aimer a highly-skilled "specialist." Such complicated pieces of mechanism as the Wimperis course-setting bomb-sight now allow the aimer to lay his bombs very correctly on the target. Using the compass and the wind-arrow, he gives directions to his pilot by telephone or speaking-tube as to what path to take. Lying prone on the floor in the nose of the bomber, encased in his thick Sidcot suit and his breathing-mask (for the height bomber may attack from as high as 25,000 ft.), he checks his levels on the bomb-sight, as well as the air-speed and height. Before releasing his bombs, it is next necessary to find the speed and direction of the wind. With the aid of the sight he spends some time checking drift, whilst his pilot flies the 'plane steadily on changing

courses as he directs. Then, and only after he is satisfied that his setting is correct, does he make his first attack, constantly directing his pilot as he glues his eyes upon the sights and the target. As the target comes correctly into his sights, he pushes a simple little pear-push (just as you may control the light over your bed or an electric bell), and thus sends perhaps a thousand pounds of death hurtling earthward, and (if all his calculations are correct) down onto his target thousands of feet below. There are, of course, other forms of bombing attack. In dive-bombing, one machine after another of a formation hurtles downward with engine full on. Each pilot aims his whole machine at the target, releases the bombs at the bottom of the dive, and climbs away. There is yet another form of attack by bomb and machine-gun which was known in the war as "ground strafing," and here in certain cases a parachute-bomb is used, so that the fall is vertical—this giving the maximum bursting effect.





THE history of practical aviation is so recent that it may seem at first sight a little odd that any talk about it should have strayed on to this page. Actually, though this special number of *The Illustrated London News* offers a particular excuse, there is no reason why a talk about the beginnings of man's conquest of the air should not appear in any number in the ordinary course of things, for there are

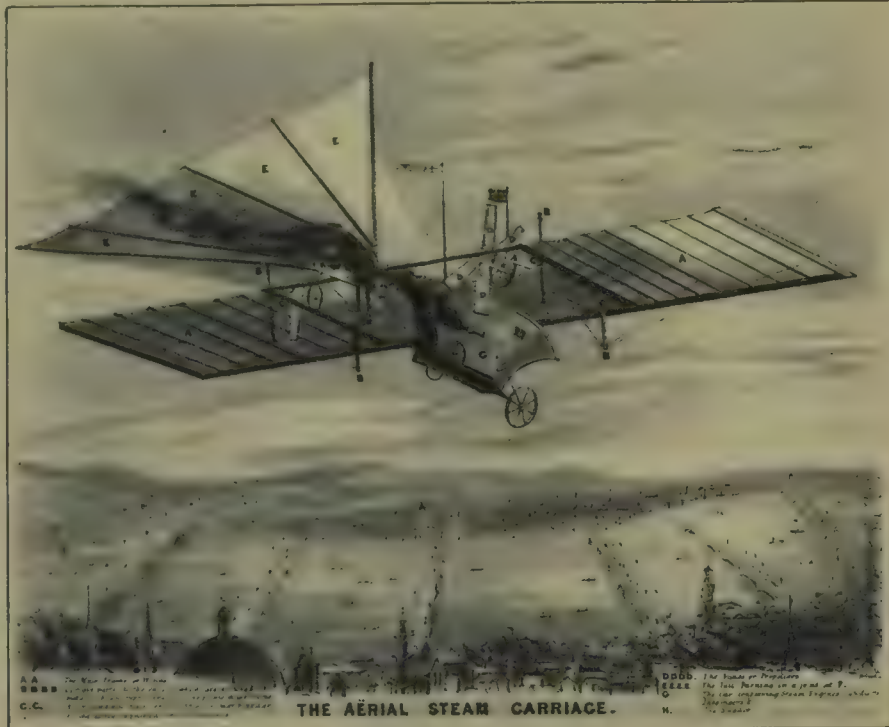
and which created a considerable stir. Even *The Times* fell a victim to a narrative which included such details as the simultaneous bursting of three of the steam pipes and the aeronaut's fall into the river, whence he was rescued by a steamer. There were also broadsides of various degrees of excellence—this sort of thing:

It matters not, I understand, whichever way the wind is,  
They'll waft you, in a day or so, right bang into the Indies!  
Or you may dine in London now, and then, if you're romantic,  
Just call a ship and take a trip right over the Atlantic.

discouraged, emigrated to America. Meanwhile, Stringfellow carried on, and in 1848 constructed a model driven by a small engine which actually flew for about 40 yards. Technical authorities all agree that the work of these two men was of genuine importance—e.g.: "Henson's adoption of the Fink truss for his wing construction as early as 1842 must be regarded as extraordinary." "His design in general contained all the essential elements of the modern aeroplane wing, such as front and rear spars, and main and secondary ribs." "The aeroplane as now known was the invention of Henson." The engine of Stringfellow's 1848 model was used for some time to drive



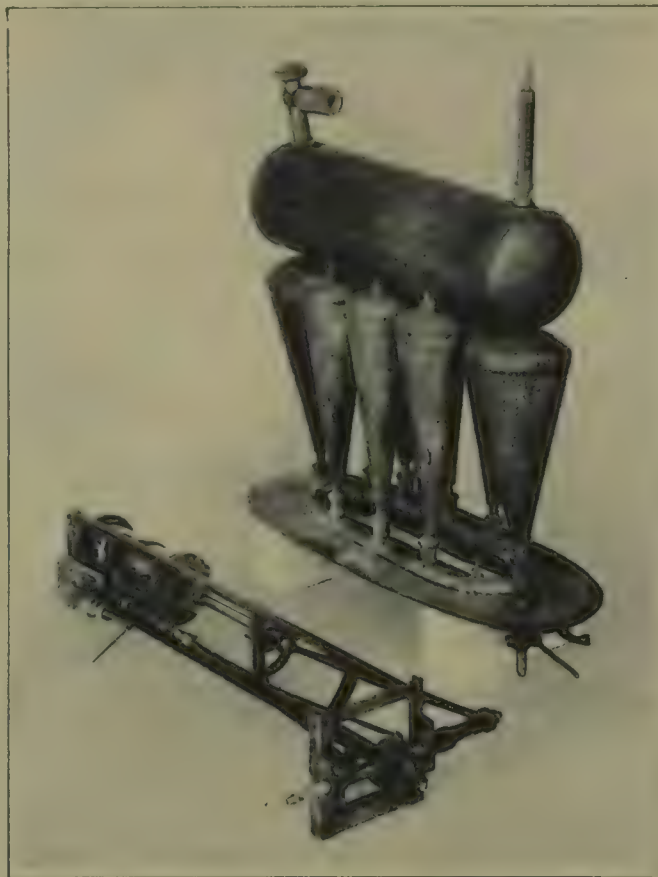
1. A MEMENTO OF AN AIR TRANSPORT PROJECT WHICH WAS PUT FORWARD NEARLY A CENTURY AGO!—AN OLD PRINT OF THE FIRST CARRIAGE, THE "AERIAL," PLANNED BY THE "AERIAL TRANSIT COMPANY," DATED 1843.—[Reproduced by Courtesy of J. Rimell and Sons.]



2. THE STRUCTURE OF THE "AERIAL STEAM CARRIAGE" (STEAM-DRIVEN) PLANNED BY HENSON AND STRINGFELLOW FOR AN AIR LINE TO CHINA AND INDIA: A PRINT GIVING DETAILS OF THE VARIOUS PARTS, INCLUDING THE MOVEABLE TAIL AND RUDDER. (Reproduced by Courtesy of J. Rimell and Sons.)

numerous prints in existence which have a bearing upon the subject, which provide an interesting and often amusing commentary upon experiments, and which are sufficiently rare to make them a little difficult to find and sufficiently cheap to make them anyone's prize. Indeed, it should be possible to get together a really comprehensive collection for, say, about £150, at an average cost of £5 apiece. Not unnaturally, prints illustrating the early balloon ascents—Montgolfier and Lunardi, for example—are more numerous than others; no doubt some of them are familiar enough to many readers already. Perhaps not so many will be able to call to mind the circumstances which produced the two prints illustrated herewith. Although they are of an aeroplane which was never actually built, they are of considerable historic importance. The experiments which resulted in a model of this aeroplane being made came to nothing, but they were practical experiments, and not mere theorising on paper. For a detailed account of the circumstances I must refer you to Mr. J. E. Hodgson's standard work on "The History of Aeronautics in Great Britain." This, briefly, is what happened: William Samuel Henson, in association with a very able engineer, John Stringfellow, began to experiment with gliding models and a light steam-engine in 1840. By 1842 plans were sufficiently advanced and a campaign was begun to interest the public in the invention. Among other forms of publicity a considerable amount of space was devoted to the proposed aerial carriage in *The Illustrated London News* of April 1, 1843. Parliament was asked to pass an Act of Incorporation for the "Aerial Steam Transit Company," and a good deal of specious and optimistic literature was issued, inviting subscriptions, notably a pamphlet, the title-page of which was as follows:

The Full Particulars of the Aerial Steam Carriage, which is intended to convey Passengers, Troops and Government despatches to China and India in a few days. 1843. The money failed to come in, and the papers began to make jokes about the scheme, the best and most successful of which was a bogus account which appeared in the *Glasgow Constitutional* of a flight over the Clyde



3. THE MOTOR OF THE FIRST HEAVIER-THAN-AIR MACHINE TO FLY: THE STEAM-ENGINE MOUNTED BY STRINGFELLOW IN THE MODEL CONSTRUCTED BY HIM IN 1848 (WHICH FLEW FOR 40 YARDS). (Reproduced by Courtesy of the Science Museum, South Kensington. Crown Copyright Reserved.)

—all of which has come to pass within a hundred years of Henson's optimistic speculation.

Henson's model was said to have flown 60 or 70 feet at the Adelaide Gallery, but this appears to be doubtful. He continued his experiments in collaboration with his partner until 1847, and then, wholly

a lace machine at Tiverton, and is now preserved at the Science Museum, South Kensington.

Two other imaginative publications must be mentioned in connection with the Aerial Steam Carriage Company. One is a print showing the Company's station "in the Plains of Hindustan," with a "despatch tower" with passenger-lift and inclined launching ways. The other is a facetious souvenir printed handkerchief showing the "Aerial" with a Chinaman (looking up through a telescope) and a deal of conversation, thus: "A special messenger, your most Celestial Highness, from the moon. I think it's fast approaching." "Hallo! Bill Jackson, keep your eye on Malta and get the parcels ready. Waken the old lady in No. 7. Drop the Pacha of Egypt's despatches. . . . Tell the Bombay Gent. in No. 5 to have his parachute in readiness, tie his hat on, shut his mouth, and keep a fast hold, as it's blowing a stiff breeze. Keep a sharp look-out for Pekin and get the Emperor of China's letter ready, as we shall drop on his Palace directly." "Dear me, if the old gent. has not lost his hat and wig and left his carpet bag behind: we had better throw it after him." "Sam, what's to become of us poor watermen? It's worse than the Thames Tunnel." And much more to the same effect, all rather childish and quite oddly Dickensian.

From a later period is an interesting chart about four times the size of a page of *The Illustrated London News*, containing fifty-three illustrations of flying machines, from Leonardo da Vinci's study of about 1500 to a project of Edison in 1880: "Tableau d'Aviation," published in Paris by E. Dieuaide. It shows the historic development, with apparatus actually constructed marked with an asterisk. Henson finds no place in it, and there is no reference to Stringfellow's model of 1848. There is, however, a later model of Stringfellow's of 1868—a triplane, which was exhibited at the Crystal Palace in that year. The chart is an interesting compilation, accurate as far as it goes, and, though unimportant, well worth the attention of collectors.



# AIRCRAFT ARMAMENT: MASSED MACHINE-GUNS; "HEAVY ARTILLERY."

Drawn by our Special Artist G. H. Davis.

**EFFECTIVE FIGHTING RANGES OF SHELL GUNS AND MACHINE GUNS.**

FIGHTER ARMED WITH 20 M.M. SHELL GUNS.

37 M.M. SHELL-GUN RANGE: 500 TO 1,000 YARDS.

FIGHTER ARMED WITH RIFLE-CALIBRE MACHINE GUNS.

20 M.M. SHELL GUN: RANGE 300 TO 700 YARDS.

MACHINE GUN RANGE: UP TO 300 YARDS.

BOMBER ARMED WITH 37 M.M. SHELL-GUNS.

**SYNCHRONISING GEAR BY WHICH MACHINE GUNS ARE FIRED THROUGH THE AIRSCREW FIELD AND THE BULLETS MADE TO MISS THE REVOLVING BLADES.**

PILOT'S SEAT.

PILOT'S FIRING TRIGGER.

CONTROL LEVER.

AIR RELEASE VALVES.

TRIGGER MOTOR.

MAIN OIL PIPE.

VICKERS GUN.

GENERATORS DRIVEN BY THE ENGINE.

BOWDEN CABLES FROM TRIGGERS, RESERVOIR.

CAMS INSIDE THE GENERATORS AND DRIVEN OFF THE ENGINE SET UP PULSATIONS (OR WAVE MOTION) WITHIN A CLOSED OIL CIRCUIT, AND THIS ACTUATES THE FIRING "SEARS" OF THE GUNS. THE WHOLE MECHANISM IS SET SO AS TO ALLOW BULLETS TO MISS THE REVOLVING AIRSCREW BLADES.

CARTRIDGE CASE CHUTE.

SECONDARY OIL PIPES.

AMMUNITION BOX.

VICKERS GUN.

**THE TURRET IS NOW IN GENERAL USE TO HOUSE BATTERIES OF MACHINE GUNS.**

THE TURRET IS RENDERED NECESSARY OWING TO THE GREAT SPEED OF MODERN AIRCRAFT WHICH MAKES IT ALMOST IMPOSSIBLE TO OPERATE OBSERVER OR MOVABLE GUNS IN THE OPEN.

A TURRET WITH MULTIPLE MACHINE GUNS.

A BRITISH ARMoured TYPE TURRET.

**THE INCREASE IN THE ARMAMENT OF BRITISH FIGHTERS**

1918 SOPWITH "SNIPE" ARMED WITH TWO SYNCHRONISED VICKERS GUNS EACH FIRING 650 ROUNDS PER MINUTE. 2 MACHINE GUNS.

1937 GLOSTER "GLADIATOR" ARMED WITH TWO VICKERS SYNCHRONISED MACHINE GUNS FIRING THROUGH THE PROPELLOR FIELD, AND TWO OUTBOARD BROWNING GUNS UNDER THE LOWER PLANE. EACH GUN FIRES WELL OVER 900 ROUNDS PER MINUTE.

1939 HAWKER "HURRICANE" ARMED WITH 8 BROWNING GUNS MOUNTED IN THE WINGS. 4 BROWNING GUNS.

1939 VICKERS-SUPERMARINE "SPITFIRE" ARMED WITH 8 BROWNING GUNS MOUNTED IN THE WINGS. 4 BROWNING GUNS.

A SMALL FORMATION OF AIRCRAFT OF EITHER OF THESE 1939 TYPES CAN FIRE A QUARTER OF A MILLION ROUNDS PER MINUTE.

**THE BROWNING AIRCRAFT MACHINE GUN, WHICH IS IN CONSIDERABLE USE TODAY.**

CARTRIDGE BELT LINK FEED OPENING.

MOUNTING.

USED CARTRIDGES EJECTION APERTURE.

BOWDEN REMOTE CONTROL CABLE.

MAGAZINE.

MAGAZINE HOLDING CLIP.

REMOTE CONTROL TRIGGER-OPERATING GEAR.

RECOIL SPRING.

AIR COOLING JACKET OVER BARREL.

MAGAZINE.

OIL INLET.

BARREL.

GAS INLET.

MAGAZINE HANDLE.

GAS CYLINDER.

CARTRIDGE DRUM.

TRIGGER.

HAND GRIP.

SHOULDER PIECE FIXING.

GRIP.

SPENT SHELL-CASE BAG.

SHELLS IN CLIP.

CLIP HOLDER.

**THE VICKERS OBSERVER'S GUN.**

FOR USE MANUALLY OR IN POWER-OPERATED TURRETS. SIMPLICITY OF CONSTRUCTION GIVES GREAT RELIABILITY AND SIMPLIFIES MAINTENANCE.

BARREL.

GAS INLET.

MAGAZINE HANDLE.

GAS CYLINDER.

CARTRIDGE DRUM.

TRIGGER.

HAND GRIP.

SHOULDER PIECE FIXING.

GRIP.

SPENT SHELL-CASE BAG.

SHELLS IN CLIP.

CLIP HOLDER.

## ARMAMENT DEVICES THAT MAKE THE MODERN FIGHTER-PLANE THE MOST POTENT INSTRUMENT OF DESTRUCTION EVER DEvised: MACHINES THAT CARRY BATTERIES OF MACHINE-GUNS; AND SHELL-GUNS WITH HIGH-EXPLOSIVE PROJECTILES.

Aircraft guns to-day are advancing with the power and speed of the aircraft designed to carry them. They now range in size from rifle-calibre guns to guns firing shells—of which the 20-mm. type are most popular—but with many types in existence, up to 37-mm. These latter weapons have great destructive effect. Their shells, and also those of the 20 mm. guns, burst on contact with the thinnest fabric, but are so designed that if they miss their target they burst at the end of their range, to prevent injuring anyone on the ground. In the Great War M. Constantinesco, a Rumanian, invented a system whereby the guns then placed on the top of the fuselage of fighters could fire through the propeller field without hitting the blades. As will be seen from the upper left-hand diagrammatic drawing, this is achieved by the engine gearing working two cams in the generators of a closed oil-circuit. The push of the cam sets up a "wave" motion inside the oil-pipes, which gives a like impulse to the

firing sears of the guns and so controls the fire. With the coming of aircraft with multiple machine-guns (such as the R.A.F. "Hurricane" and "Spitfire"), the difficulty of synchronisation of eight guns is avoided by placing the guns in the wings outside the periphery of the air-screw, so that gearing and synchronising is no longer necessary, and thus the popularity of synchronising gear is now passing. Shell-guns, of which we give illustrations of widely-used examples are very popular abroad, and are now being fitted to British aircraft. They are quick-firing, effective weapons whose shells have considerably more destructive power than machine-gun bullets. In single-engine aircraft the gun is fixed between the blocks of cylinders and the muzzle passes through the hollow shaft of the reduction gearing and through the boss of the propeller. The Vickers observer's gun is a very simple and satisfactory weapon—easy to handle, reliable, very free from "jamming," and easy to maintain.







# TRAINING THE A.A.F.—THE AIR FORCE EQUIVALENT TO THE TERRITORIALS.



PRACTISING MACHINE-GUNNING WITH THE PROPELLER REVOLVING: MEN OF A FIGHTER SQUADRON OF THE AUXILIARY AIR FORCE AT HENDON. (L.N.A.)



CAMBRIDGE UNDERGRADUATES STUDYING STRUT AND WING CONSTRUCTION: MEMBERS OF THE C.U.A.S. RECEIVING TECHNICAL INSTRUCTION. (Fox Photos.)



LINED-UP FOR INSPECTION AT CARDIFF AIRPORT: PERSONNEL AND AIRCRAFT OF THE COUNTY OF GLAMORGAN AUXILIARY AIR FORCE. (A.P.)



SERVICING A HAWKER "HIND" MACHINE: AIRMEN OF THE CITY OF EDINBURGH BOMBER SQUADRON OF THE A.A.F. (Fox Photos.)



REFUELLING AIRCRAFT OF THE AUXILIARY AIR FORCE: A HAWKER "DEMON," BELONGING TO NO. 601 SQUADRON, AT HENDON AERODROME. (Charles E. Brown.)

The Auxiliary Air Force consists of flying squadrons and balloon squadrons, and forms part of the Home Defence organisation, the various sections—such as bombers, fighters, and balloons—coming under the direction of appropriate R.A.F. Commands. Each unit of the A.A.F. is raised and maintained on a territorial basis by a Territorial Army and Air Force Association. There are twenty Auxiliary Air Force squadrons, comprising Bomber squadrons, Fighter squadrons, and Army Co-operation squadrons. More than twenty Balloon squadrons have been established,

and others are rapidly being added. In addition to the General Duties Branch, there are Equipment, Accountant, Medical and Chaplains' Branches. The maximum initial period of service for officers is five years from the date of appointment. Service may be extended for further periods until the age limit is reached, or, alternatively, officers may transfer to the A.A.F. Reserve of Officers. Each squadron contains a staff of Regular Air Force personnel to form the nucleus of the administration and maintenance of the unit, and to instruct the volunteer personnel.



## AN IMPORTANT BRANCH OF THE ROYAL AIR FORCE: TRAINING MEMBERS OF THE GROUND SECTION OF THE VOLUNTEER RESERVE.



ENJOYING THE  
FACILITIES  
PROVIDED FOR  
RECREATION AFTER  
AN EVENING'S  
COURSE OF  
INSTRUCTION:  
MEMBERS OF THE  
GROUND SECTION,  
R.A.F. VOLUNTEER  
RESERVE, AT A  
TRAINING SCHOOL.



PRACTICAL INSTRUCTION FOR  
THE GROUND SECTION OF THE  
R.A.F. VOLUNTEER RESERVE:  
DISMANTLING AN AIR-COOLED  
AERO ENGINE.

THE ground section of the R.A.F. Volunteer Reserve has a special appeal for men who are mechanically inclined or who have some knowledge of mechanical engineering. Although recently formed, members of this section display great keenness for their work, which is perhaps not as spectacular as that of the flying personnel, but of vital importance to the efficiency of the Service. Men join for an initial period of five years and must be between the ages of eighteen and fifty. Those who wish to train as flight mechanics and riggers are enlisted as aircraftmen, second class, group V., and later are transferred to their appropriate trade group. Instruction is given at civil training schools and at R.A.F. stations. Men who have served in the Royal Flying Corps, Royal Naval Air Service, or the R.A.F. can now rejoin in the Class "E" Reserve.

Photographs by Central Press.



CONSTRUCTING AN AIR FRAME—THE PROGRESS MADE REFLECTING THE KEENNESS DISPLAYED BY MEMBERS OF THE GROUND SECTION: MECHANICALLY INCLINED RESERVISTS LEARNING THE WORK OF FLIGHT RIGGERS.



PART OF THE COMPREHENSIVE COURSE WHICH IS TAKEN BY THOSE TRAINING TO BE FLIGHT MECHANICS AND RIGGERS IN THE ROYAL AIR FORCE VOLUNTEER RESERVE: THEORETICAL INSTRUCTION BEING GIVEN TO A CLASS BY A FULLY QUALIFIED INSTRUCTOR.



THE FITTERS' CLASS: RESERVISTS ENGAGED ON THE COMPONENT PARTS OF A TWELVE-CYLINDER "NAPIER LION" ENGINE UNDER THE EYE OF THEIR INSTRUCTOR.



# THE MAKING OF AIR PHOTOGRAPHS BY THE R.A.F. : INSTRUCTION IN CAMERAS AND DARK-ROOM METHODS.



AN R.A.F. PHOTOGRAPHER USING A HAND-HELD CAMERA TO OBTAIN "OBLIQUE" PHOTOGRAPHS. THE CAMERA HAS A LENS OF WIDE-APERTURE, AND A SPECIAL VIEW-FINDER.



"OBLIQUE" PHOTOGRAPHS BEING TAKEN BY AN R.A.F. PHOTOGRAPHER USING A HAND-HELD AUTOMATIC ROLL-FILM CAMERA. THE PHOTOGRAPHER AND THE PILOT WEAR EAR-PHONES FOR THE PURPOSE OF CO-ORDINATING THEIR WORK.



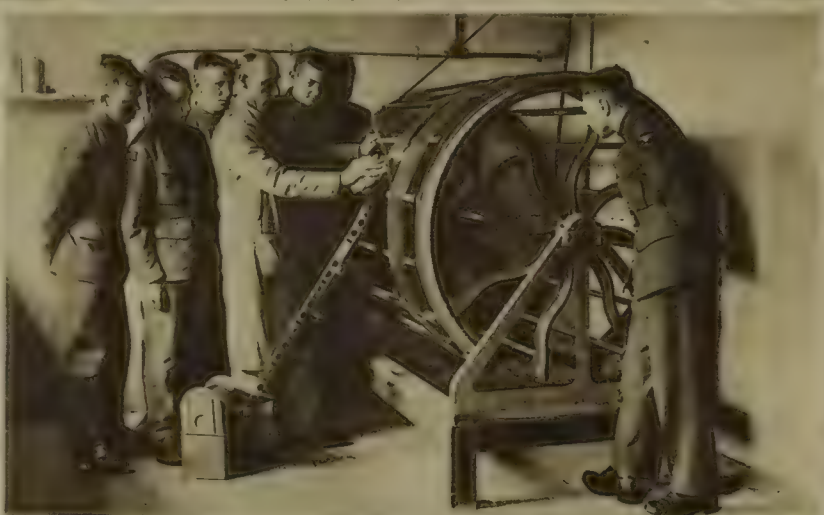
A CLASS OF R.A.F. PERSONNEL RECEIVING INSTRUCTION DEALING WITH THE MECHANISM OF AUTOMATIC AERIAL CAMERAS AND THE WAY IN WHICH THEY ARE PLACED ON RUBBER SHOCK-ABSORBERS IN A SPECIAL CRADLE WITHIN THE AEROPLANE.



AN AUTOMATIC AERIAL CAMERA BEING FITTED INTO ITS SPECIAL CRADLE WITHIN THE AEROPLANE. THE CAMERA IS DRIVEN ELECTRICALLY AND TAKES "VERTICAL" PHOTOGRAPHS.



R.A.F. AERIAL PHOTOGRAPHS ARE EXPOSED ON ROLLS OF FILM EACH 35 FT. LONG. OUR PHOTOGRAPH SHOWS AN EXPOSED FILM BEING WOUND ON A SPECIAL HOLDER FOR DEVELOPMENT BY THE TANK METHOD.



THE EXPOSED FILM, AFTER IT HAS BEEN DEVELOPED, FIXED AND WASHED, IS WOUND AROUND A LARGE CIRCULAR FRAME WHICH IS REVOLVED BY AN ELECTRIC MOTOR TO MAKE THE FILM DRY QUICKLY.

Our photographs show R.A.F. personnel, aerial cameras, and processing methods at the School of Photography, South Farnborough. There the men are instructed in the taking of air photographs, mechanism of the cameras and dark-room procedure. The importance of aerial photography was proved during the Great War

of 1914-1918, when photographs of hostile gun positions, trenches and barbed wire, railheads, ammunition dumps, and camouflaged positions gave information of the greatest value. Many important operations were based upon knowledge derived from studying air photographs taken by squadrons working on the various fronts.



# THE EVER-INCREASING RANGE OF R.A.F. BOMBERS PICTORIALLY SHOWN.



## THE LONG ARM OF THE R.A.F.—A DETERRENT TO AGGRESSION: A PICTORIAL TABLE OF BRITISH BOMBERS' RANGES, INCLUDING A MARVELLOUS NEW TYPE WHICH COULD FLY NON-STOP WITH FULL LOAD AS FAR AS KHARTOUM!

There has been a vast increase in the range of the bombers of to-day compared with the Handley Page "O400," our heavy bomber of the war period, and the "D.H.9a" a famous type of light bomber of about the same era. All Europe is within the range of our modern machines. The mileage figures given in this drawing are for a bomber fully equipped with fuel, crew, bombs and guns. The Vickers "Wellington" has the enormous range of 3240 miles, which means it could, fully loaded, fly from round London to beyond Khartoum. It is a mid-wing monoplane incorporating geodetic construction. It is powered with two Bristol "Pegasus," geared, supercharged engines developing 1800 h.p. The "Hampden," another of our latest medium bombers, has wings specially tapered and designed to give the greatest economy in structural weight and the highest degree of manoeuvrability. The crew consists of four. The Mark IV. type "Blenheim" has been provided with a "long nose" and extra tankage, giving

it a range of 1990 miles. The "Sunderland," which is not strictly a bomber, but a long-range reconnaissance flying-boat, though it could, of course, carry bombs if necessary, has been developed from the famous Short Imperial Airways flying-boats. It can take off in 33 seconds, and its total horse-power is 3360. It is illustrated because it is a very reliable and remarkable long-range aircraft, and the biggest aircraft in use to-day in the R.A.F. The Armstrong-Whitworth "Whitley IV.," another modern type, is a mid-wing cantilever heavy bomber, carrying a crew of five, with a total power output of over 2000 h.p., giving a top speed of 235 m.p.h. The Fairey "Battle," a medium bomber, has a crew of three, and a top speed of 257 m.p.h. Its service ceiling is 26,000 ft., and it can climb to 15,000 ft. in sixteen minutes. At the same range (1200 miles) is the obsolescent "Harrow," not shown in this illustration, of which there are still a few in service. (DRAWN BY OUR SPECIAL ARTIST G. H. DAVIS.)



AT the end of the Great War the Government had to take a decision upon the organisation of the peace-time Air Force. An intermediate organisation, drawn up in 1919, was worked to for some years, and in 1923 it was decided to adopt a long-term scheme for raising the strength of the Home Defence Air Force to 52 squadrons, of which 39 were to be regular and 13 were to be manned by auxiliaries or special reservists. So began what was until recent years the principal development of the post-war air force. By 1934 the size of the force, including the Fleet Air Arm and the squadrons overseas, had reached about 87 squadrons, and its personnel strength numbered some 30,000 officers and men.

It is right that we should pay a tribute to the men who composed the Royal Air Force at this time, as they formed the nucleus of the huge expansion which was to follow. Their efficiency was due in the fullest measure to the outstanding work of Lord Trenchard, in the difficult years which followed the war. The skill with which Lord Trenchard directed the post-war reconstruction and his insistence upon the highest standards of training, created a Force whose experience and enthusiasm were destined to be of vital importance to the security of the country. In 1934 it became clear that it was necessary to aim at a considerably higher standard of air strength. In July 1934 the first scheme of expansion was announced, involving the addition to the Royal Air Force of 41 squadrons, of which 33 were to be stationed at home. This scheme, which would have raised the strength of the Metropolitan Air Force to a total of 84 squadrons, was due for completion by April 1939.

This first expansion scheme had been in progress no more than a matter of months when it became apparent that a new and greatly expanded programme was necessary. In May 1935 the Government announced their intention of increasing the first-line strength of the Metropolitan Air Force by some 71 squadrons by April 1937. Thus, in place of a programme involving the addition of 33 squadrons to the Metropolitan Air Force in the space of over four years, was substituted a new programme which required the addition of more than double that number of squadrons in less than half that time.

Despite the scale of this enlarged programme, the developments in the international situation soon necessitated a further review, and in 1936 a third programme was announced. This new scheme, into which the earlier programmes were merged, involved a further increase in first-line strength of the Air Force, but its principal features were the re-equipment of the Force with new and more powerful types of aircraft, the equipping of squadrons with a full scale of war reserves of aircraft and equipment, and, in addition, the organisation in industry of the war potential necessary to provide for a greatly increased rate of production in time of war.

Since that scheme further vast measures have been superimposed. Just over a year ago it was decided to increase the strength at home to 2370 first-line aircraft by March 1940. Thus, including increases overseas and in the Fleet Air Arm, the air strength of the country was to be raised to a total approaching 3500 first-line aircraft. Later in the year, following the emergency of September 1938, a yet greater programme was announced in the House of Commons by the present Secretary of State. The programme provides for substantial increases in first-line strength both at home and abroad, but its effect is not to be judged in terms of numbers of first-line aircraft alone. The main emphasis is upon the strengthening of reserves, the broadening of the bases of production, and generally the organisation of the entire force in a manner which would make possible sustained and formidable operations in war. It is upon this latest programme that we are now engaged, and I would like at this stage to say a few words about the progress we are making. There are three basic requirements to satisfy in a large expansion programme: men, material, and (in the widest sense of the word) ground organisation. All three are vital.

First, as to personnel. When expansion began, the personnel strength of the Royal Air Force was about 30,000 officers and men. On April 1 this year the corresponding figure was approaching 100,000. Thus, in the space of under five years the personnel strength of the

## FORGING A WEAPON THAT WILL MAKE BRITAIN INVINCIBLE IN THE AIR:

FACTS AND FIGURES OF THE ASTONISHING PROGRESS MADE IN THE EXPANSION OF THE ROYAL AIR FORCE.

By Air Chief Marshal SIR CYRIL NEWALL, G.C.B., C.M.G., C.B.E., Chief of the Air Staff.

regular force has been trebled, a rate of expansion never before attempted in time of peace. This bare recital of figures conceals two remarkable and encouraging facts. First, we may remark upon the magnificent response to the recruiting programme which has made it possible to satisfy the requirements. From all over Great Britain and the Empire young men have come forward with all the enthusiasm, and in just that spirit of adventure with which their forefathers answered the call of the sea. But there was another vital consideration to be watched. The flying Service in a very real sense, is a *corps d'élite*, and exacting standards must be insisted upon in those who join it. How far could this requirement still be satisfied in meeting the huge numbers which are now necessary? The answer—and a deeply reassuring answer it is—is that the quality of the men coming forward is as fine as ever it was. The answer of all the inspecting officers who have watched this point carefully from the start is unanimous. A finer augury for the future of the British race could scarcely be imagined.

In parallel with the strengthening of the regular Air Force, a vast expansion is being effected in the matter of personnel

nearly £2,000,000 per week on the production of aircraft alone. Space does not permit me to deal with the multitude of other vital necessities. I can only say that the necessary work is being done, finely and thoroughly.

I must, however, say one word about the quality of our new aircraft. On Empire Air Day nearly a million people visited the Air Force stations which were open to the public. Never has a fighting service been so thoroughly inspected. The British public saw for itself the splendid aeroplanes which are now in service. Their standards are high in this matter, but I think they were satisfied. Those who are responsible for these questions at the Air Ministry know that the aircraft now in service are as good as the best anywhere in the world. What the British public did not see on Empire Air Day were the secret types which will be flying in the Service in the near future, which carry a stage further even the astonishing developments of recent years.

It is impossible to deal adequately in this article with the third factor in our expansion—namely, organisation. The great Force we are building up must be wielded

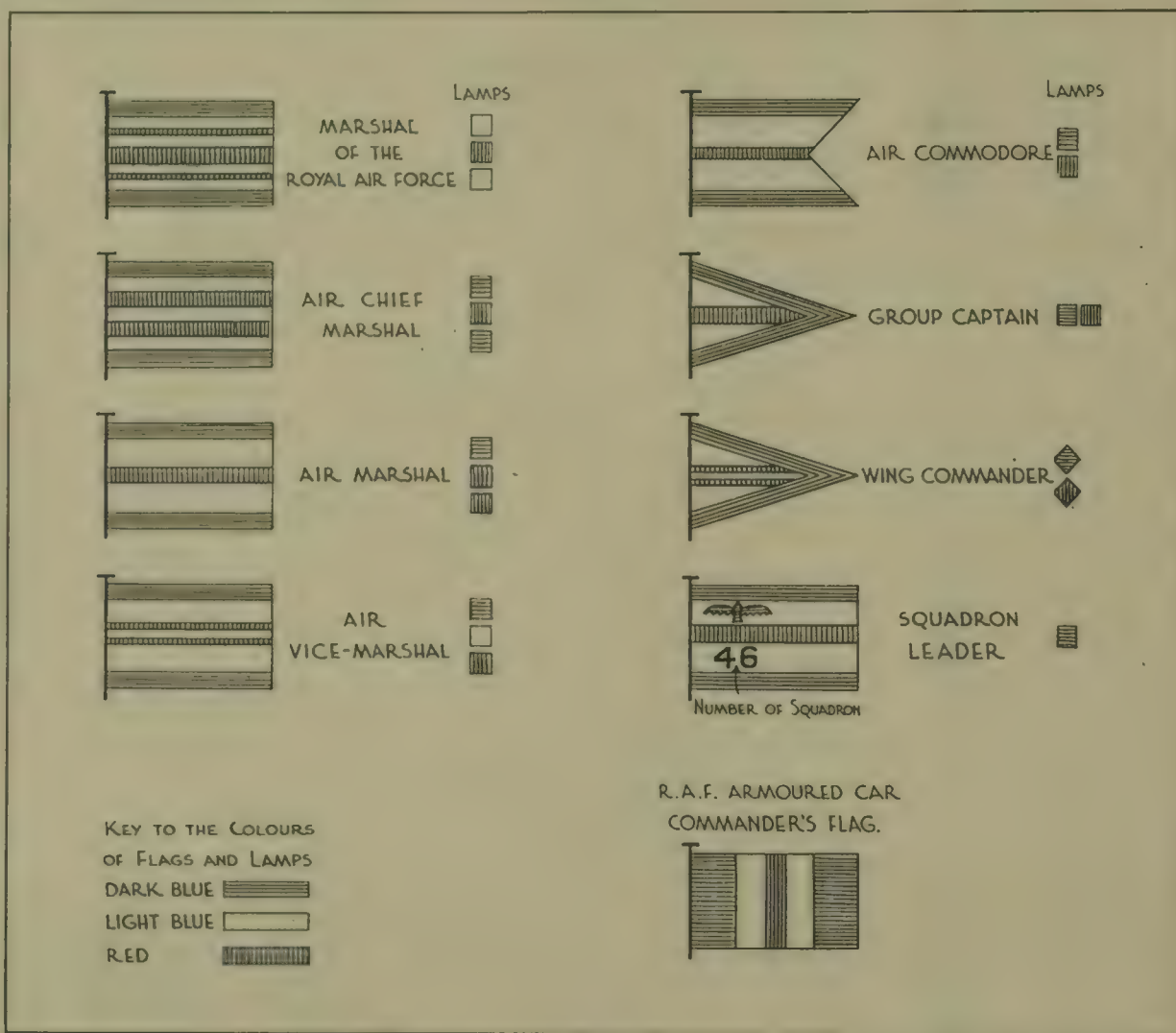
with the maximum of efficiency. It must be able swiftly to concentrate where the need is greatest. Its needs in material and skilled personnel must be rapidly and effectively forthcoming. There is a vast building programme to be provided for. With so great an effort, and so great a sacrifice to achieve it, there must be no wasted energy. It is only possible to say that these problems have been tackled resolutely from the outset, and that the machine, in all its activities, is working well.

Looking at the picture as a whole, we see a magnificent Force already in being, whose strength is increasing by giant strides. It has been built on broad and deep foundations so that it may possess endurance as well as initial strength. It is endowed with the best that the manhood and engineering skill of the Empire can provide. The greater part of the strength of this force is being concentrated at home, where the need at the moment is greatest. But all over the Empire our defences are being strengthened with the aim, in co-operation with the other Services, of meeting possible danger wherever and however it may arise.

What is the significance of this great

effort which is being made? For many years this country, and the British Commonwealth as a whole, lived in safety behind the sure shield provided by the sea and an invincible British Fleet. With the conquest of the air, naval strength, vital as it still is, is not enough. We must be strong also in the air. That is why we are making this great effort and spending these vast sums of money on our air programme. We know too that a strong Air Force is a powerful deterrent, and that a Britain armed and determined to defend the principles in which she believes is a sheet-anchor for world peace.

I have tried to show that the fulfilment of our determination to achieve a standard of air strength which will be adequate to our needs is vastly more than a matter of accumulating large numbers of men and aircraft. Instead, a nation's efforts, and a nation's enthusiasm, are being harnessed to produce a strong, a balanced, and a magnificently equipped Air Force, disposed in accordance with strategical necessities. Our responsibility is the defence of a great Empire, and we are doing our best to deal worthily with it. We are building a great Air Force. We know that the men who are manning it are as fine as ever before. The resources of a great engineering industry are being devoted to producing the best equipment that modern skill can devise. The nation, in fact, is putting its back into the task; I think it may also be confident that we are creating an Air Force of which the nation will be proud.



FLAGS OF THE R.A.F.: THE PENNONS DISPLAYED BY HIGH OFFICERS AND COMMANDERS OF UNITS; AND THE CORRESPONDING COMBINATIONS OF COLOURED LIGHTS USED AT NIGHT.

reserves, without which a fighting service could never hope to survive in time of war. The Auxiliary Air Force has been much increased in size, while the range of its activities has been extended to cover the Balloon Barrage scheme in London and in the provinces. The Volunteer Air Force has been formed to provide every class of personnel reserve which will become necessary in war, and it is making magnificent progress.

Altogether, some 75,000 men will be required this year for the regular and the reserve Air Forces. A great effort is therefore still necessary, but so deep is the interest of the country in air defence and so wide is the appeal of Service flying to the spirit of youth, that I know that even this vast number will be obtained and, if necessary, surpassed.

The progress which is being made in the matter of personnel is matched by the efforts in regard to material. It is difficult to draw an adequate picture of what is being done, because figures of production must necessarily remain secret. The problem is one not only of meeting the requirements of a peacetime expansion, but also of providing the necessary framework and organisation which will make possible the huge output which would become essential in war. The material requirements of a modern Air Force are of wide complexity and of astronomical magnitude. The whole range of equipment—airframes, engines, bombs, magnetos, carburettors, and a thousand other items—must all be duly correlated, or bottle-necks in production will result. The effort which is being made in the matter



## THE R.A.F. OVERSEAS: VICKERS "VALENTIA" TROOP-CARRYING BOMBERS.



AN ASPECT OF THE DUTIES PERFORMED BY THE ROYAL AIR FORCE OVERSEAS: TROOPS WITH PACKS AND RIFLES ENTERING A VICKERS "VALENTIA" BOMBER-TRANSPORT BIPLANE—AN AIRCRAFT POWERED WITH TWO BRISTOL "PEGASUS" ENGINES AND PROVIDING ACCOMMODATION FOR A CREW OF TWO AND TWENTY-TWO MEN.



A FLIGHT OF VICKERS "VALENTIA" BOMBER-TRANSPORTS MANOEUVRING OVER THE MOKATTEM HILLS SOUTH-EAST OF CAIRO: A TYPE OF AIRCRAFT WHICH HAS PROVED OF IMMENSE VALUE IN DESERT OPERATIONS FOR TRANSPORTING TROOPS AND SUPPLIES AS WELL AS FOR OFFENSIVE PURPOSES.

The duties of the Royal Air Force overseas are extensive and often carried out under active service conditions. Iraq has been successfully garrisoned for many years by aircraft supported on the ground by armoured cars manned with R.A.F. personnel, and the principle of air control has been extended to Aden and Trans-Jordan. In Palestine air squadrons have been used to locate Arab bands in hilly country and have co-operated with the troops when resistance has been encountered by diving on the insurgents and machine-gunning them. During operations

on the North-West Frontier, squadrons of R.A.F. aircraft have been used for reconnaissance, for dropping supplies and ammunition to advanced posts in difficult country, for bringing up reinforcements and evacuating wounded. They have also performed valuable work by flying over hostile villages and warning the inhabitants by loud-speaker that air action would be taken unless they surrendered. If no notice is taken the crops are destroyed and this speedily leads to submission. Flying-boats and torpedo-bomber squadrons are stationed at Singapore. (Chas. E. Brown.)



## EARLY STAGES OF AN AIR OBSERVER'S TRAINING: INSTRUCTION AT A CIVIL FLYING SCHOOL.



IN THE CHIEF GROUND INSTRUCTOR'S OFFICE AT ANSTY: FLYING-OFFICER  
A. J. S. MORRIS INTERVIEWING TWO AIR OBSERVERS.



RECEIVING INSTRUCTIONS FROM THE PILOT (CENTRE): TWO AIR OBSERVERS  
ENGAGED IN LEARNING THE INTRICATE ART OF AERIAL NAVIGATION.



A PARADE OF AIR OBSERVERS IN FULL FLYING KIT—GIVING A BUSINESS-LIKE  
IMPRESSION WITH THEIR AERIAL NAVIGATION INSTRUMENTS.



TRAINING IN A "FLYING SCHOOLROOM": TWO OBSERVERS RECEIVING FINAL  
INSTRUCTIONS FROM THE PILOT WHO IS ABOUT TO TAKE THEM ALOFT.



KEEPING IN TOUCH WITH MACHINES ON INSTRUCTIONAL FLIGHTS FOR OBSERVERS:  
WIRELESS OPERATORS AT THE CIVIL FLYING SCHOOL AT ANSTY.

On these two pages are illustrated phases of an observer's training: on the left at a civil flying school (Ansty in this case) and on the right at an R.A.F. Observers' School (North Coates). Increasing specialisation has led to the direct recruitment into the Royal Air Force of men to be trained as observers. The

work of an observer may be said to consist of most of the duties in an aeroplane which are not carried out by the pilot. Needless to say, the difficulties of an observer have increased enormously since the war: this is clearly illustrated by one example alone: in a wartime machine the observer generally sat in an open

[Continued opposite.]



## THE FASTEST SINGLE-ENGINE BOMBERS IN SERVICE WITH THE R.A.F.: FAIREY "BATTLE" DAY BOMBERS IN FLIGHT.



A SQUADRON OF FAIREY "BATTLE" BOMBERS IN FORMATION FLIGHT OVER BICESTER, OXFORDSHIRE: FORMIDABLE MACHINES WHICH HAVE A MAXIMUM SPEED OF 257 M.P.H. AND A RANGE OF 1000 MILES AT A HEIGHT OF 16,000 FEET.

The Fairey "Battle" two-seat day bomber is the fastest of the three more modern types of single-engined bombers now in service with the Royal Air Force. It is a low-wing, all-metal cantilever monoplane which carries a disposable load of 4125 lb. at a maximum speed of 257 m.p.h., with

a Rolls-Royce "Merlin II," engine. The service ceiling is 25,000 ft., and at 16,000 ft. the machine has a range of 1000 miles. The crew of two or three are housed in a long cockpit, the cover of which is hinged at the rear to allow the gunner free and sheltered use of the back gun. A fixed Browning

gun is carried in the starboard wing for the pilot's use, and the main bomb-load is stowed in four cells in the wings, but additional bombs can be carried on external racks. The equipment includes wireless, night-flying instruments, and oxygen for high-altitude flights. Prior to 1937 the Hawker

"Hart" was the standard day bomber of the R.A.F., but in that year the adoption of monoplanes made it obsolete. The "Battle" bomber is now being turned out in large numbers by the Fairey Aviation Company's factory at Stockport, and by the Austin factory at Birmingham. (Photograph by F.V.A.)



## FIGHTERS



## BOMBERS



## ARMY CO-OPERATION AIRCRAFT



## GENERAL RECONNAISSANCE AIRCRAFT



THE HUGE ARRAY OF AIRCRAFT IN THE R.A.F. TO-DAY—IMPOSING FOR ITS SIZE AND VARIETY: THIRTY-SEVEN TYPES OF MACHINE—RANGING FROM THE GREAT "SUNDERLAND" FLYING-BOAT TO LIGHT TRAINERS—ALL OF WHICH ARE IN ACTUAL PRODUCTION FOR SERVICE WITH SQUADRONS.

Here is shown in one comprehensive drawing the various types of aircraft that go to make the squadrons of the Royal Air Force to-day. New types that have not yet been issued to the squadrons are not included, with the exception of the new Boulton Paul two-seater fighter, "Defiant," which is now in production, and is too important an aircraft to leave out. The other types shown are, in their various categories, now in quantity production at the Harland-Short works at Belfast. All the other types shown are, in their various categories, now in quantity production at the Harland-Short works at Belfast. All the other types shown are, in their various categories, now in quantity production at the Harland-Short works at Belfast.

armed—from the "Gauntlets" that still stand in the line with a speed of 230 m.p.h. and two guns, to the "Spitfires" of over 360 m.p.h. and eight guns. The "Whitleys," one of our latest types of heavy bombers, were originally equipped with air-cooled radials, but the latest types now mount two Rolls-Royce "Merlin" engines, each of 1030 h.p. The other modern heavy bomber now being produced in large quantities is the powerful Vickers "Wellington," the performance figures of which were still confidential when the drawing was made. They have since been issued by the Air Ministry as: speed, 275 m.p.h.; service ceiling, 24,500 ft.; and range, 3240 miles. Another outstanding aircraft is the long-range Vickers "Wellesley," a general-purpose machine. Aircraft of this type, it will be remembered, recently flew

non-stop from Egypt to Australia, establishing a long-distance non-stop record. The great Short flying-boat, "Sunderland," with its total motive force of over four thousand horse-power, is the finest of its type in the world, and has been developed from Imperial Airways' successful "Empire" boats. Training in the R.A.F. is now stepped-up by various stages, so that the budding pilot progresses from the De Havilland "Tiger Moth," or the Avro "Tutor," on which thousands of our present-day pilots first learned to fly, to the advanced trainers, such as the 270-m.p.h. "Master," or the North American Corporation's product, known as the "Harvard." The Gloster "Henley," which is used for target-towing duties, is not merely a means to pull a target rapidly through the air, but is a very fast and powerful fighter-light bomber.

The Bristol "Blenheim" Mark IV., or, as it is generally known, "The Long-Nose," can not only be used as a medium bomber, but is now being powerfully armed, so that it takes its place in the line as a long-range fighter. Thus it fills a gap in the ranks of our fighters until new and even more powerful types come into commission. Whereas the single-seater fighters have a comparatively short range, the "Blenheim" Mark IV. can engage hostile bomber formations far away from their objectives—indeed, soon after they leave their own bases, and long before they come within the radius of action of the single-seater fighters, thus initiating a new stage of offensive-defence against raiders. (DRAWN BY OUR SPECIAL ARTIST, G. H. DAVIS, WITH THE ASSISTANCE OF THE AIR MINISTRY.)



## A HIGH-SPEED TRAINER FOR THE R.A.F.: THE PROTOTYPE MILES "MASTER."



BANKING HIGH ABOVE THE CLOUDS : A STRIKING PHOTOGRAPH OF THE MILES "MASTER," A TWO-SEATER ADVANCED TRAINER NOW IN LARGE-SCALE PRODUCTION FOR THE ROYAL AIR FORCE, IN FLIGHT.

The expansion of the Royal Air Force has necessarily led to an increase in the number of aircraft used for training pilots at the Flying Training Schools. The older types of biplanes are being supplemented by new monoplane aircraft which will gradually replace them as the rate of production improves. The standard monoplane for elementary training is the Miles "Magister," and the firm which is responsible for producing this aircraft is now in large-scale production with the Miles "Master," a larger and more powerful two-seater for advanced training. This machine is fitted with a Rolls-Royce "Kestrel XXX."

engine developing a maximum speed of 268 m.p.h. and is intended for the preliminary instruction of pilots in the handling of fast aircraft, such as the Supermarine "Spitfire" and the Hawker "Hurricane." It has a range of 440 miles and is equipped with machine-guns and bomb-racks. Four hundred North American "Harvard" two-seater low-wing monoplanes are being obtained from America and will also be used for advanced training. A pilot takes some ten months to train, but his instruction is very thorough and includes blind flying, night flying, and formation work. (L.N.A.)



# THE FASTEST BOMBERS IN THE R.A.F.: "LONG-NOSED" BRISTOL "BLENHEIMS."

Do not cut along this edge, but unfold the Panorama overleaf.



**A FLIGHT OF BRISTOL "BLENHEIM" TWIN-ENGINE BOMBERS CARRYING OUT HIGH-SPEED RECONNAISSANCE: AIRCRAFT OF AN ARMY CO-OPERATION UNIT FLYING IN FORMATION; SHOWING THE POWER-OPERATED GUN-TURRET.**

The Bristol "Blenheim" is the fastest bomber at present in service. It may be described as a comparatively small, twin-engine high-performance day-and-night bomber which, in its earlier form, has a maximum speed of 285 m.p.h. and a range of 1125 miles. The new "long-nosed" type of "Blenheim" not only provides better facilities for navigating, bomb-aiming and photography, but also has an increased range of 1900 miles, with a speed of 295 m.p.h. at 15,000 ft. This aircraft, which has two Bristol "Mercury VIII." engines, is now being issued to certain Army co-operation units as a long-range high-speed reconnaissance machine. The "Blenheim" carries a crew of three—a pilot, a bomb-aimer-navigator, and a wireless-operator-gunner—and has one forward-firing

gun in the port wing and one gun in a retractable hydraulically-operated turret mounted midway along the top of the fuselage. The bomb load is carried internally in a bomb-cell under the centre section and the fuses are set and released by electrically operated gear. The equipment is very extensive and includes two-way wireless, night-flying instruments, oxygen apparatus, and an automatic pilot, if required. A collapsible dinghy is also carried if the aircraft is taking part in operations over water. During 1938 the "Blenheim" was in full production at the Bristol Aeroplane Company's factory at Filton and at Rootes' "shadow factory" at Speke. Our photograph shows a flight of these machines from an Army Co-operation unit carrying out reconnaissance operations. (L.N.A.)





### MARSHAL OF THE ROYAL AIR FORCE: HIS MAJESTY KING GEORGE VI.

H.M. the King, who is a Marshal of the R.A.F. and Air Commodore-in-Chief of squadrons comprising the Auxiliary Air Force, was attached to the Royal Naval Air Service station at Cranwell in February 1918. When the R.N.A.S. and the Royal Flying Corps were joined two months later and became the R.A.F., the King (then Prince Albert) was one of the first naval officers to become an officer

or the new Service, with the rank of Captain. In August he served with the R.A.F. Cadet Brigade at Hastings, and later was on the Headquarters Staff of the Independent Force, R.A.F., at Nancy. He was promoted Group Captain in 1921; Air Vice-Marshal in 1932; Air Marshal and Air Chief Marshal in 1936; and assumed the rank of Marshal of the Royal Air Force in December 1936.

REPRODUCED IN COLOUR FROM THE PHOTOGRAPH BY WALTER STONEMAN, F.R.P.S. (LONDON).



# The World's Fastest Fighter in Service: The Supermarine "Spitfire."



*Photograph by Charles F. Brown.*

THE R.A.F.'S MAGNIFICENT INTERCEPTOR FIGHTER, WHICH CAN CLIMB TO 11,000 FEET IN 4·8 MINUTES: THE SUPERMARINE "SPITFIRE" (ROLLS-ROYCE "MERLIN" ENGINE), A TYPE PRODUCED BY MESSRS. VICKERS-ARMSTRONGS LTD., AT THEIR AVIATION WORKS AT WEYBRIDGE, AND THE SUPERMARINE WORKS AT SOUTHAMPTON.



# "For Acts of Valour, Courage, and Devotion to Duty."



## DECORATIONS OF THE ROYAL AIR FORCE AND THE AIR FORCES OF THE DOMINIONS.

1. DISTINGUISHED FLYING CROSS, OBVERSE. 2. DISTINGUISHED FLYING CROSS, REVERSE. 3. AIR FORCE CROSS, REVERSE. 4. AIR FORCE CROSS, OBVERSE.  
5. DISTINGUISHED FLYING MEDAL (ABOVE), REVERSE; (BENEATH) OBVERSE. 6. LONG SERVICE AND GOOD CONDUCT MEDAL (ABOVE) OBVERSE; (BENEATH) REVERSE.  
7. AIR FORCE MEDAL (ABOVE), REVERSE; (BENEATH) OBVERSE.

All the above decorations, except the Long Service and Good Conduct Medal, were instituted by Royal Warrant on June 3, 1918. The Long Service and Good Conduct Medal, for which men with eighteen years' regular service are eligible, was instituted in March 1919, and it was first awarded in 1924. The Distinguished Flying Cross is awarded to officers and warrant officers for acts of exceptional valour, courage

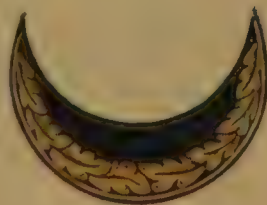
or devotion to duty while flying in active operations against the enemy. The Air Force Cross is awarded on the same basis, but for acts "while flying, though not in active operations against the enemy." The Distinguished Flying Medal and the Air Force Medal are the counterparts of the Distinguished Flying Cross and the Air Force Cross respectively, but are awarded to non-commissioned officers and men.



## BADGES OF RANK AND DISTINCTIVE BADGES FOR OFFICERS.

Air Officers.  
(Cap peak.)

Chaplain's Collar Badge.

Group Captains.  
(Cap peak.)

Pilot's Badge.



Observer's Badge.



Officers of Air Rank.



Officers below Air Rank.

Medical Officer's  
Collar Badge.

Chaplain's Cap Badge

The Badge worn by  
Officers serving in units  
of the Fleet Air Arm.

## WARRANT OFFICERS' AND N.C.O.s.' BADGES.



Warrant Officer.



Flight-Sergeant.



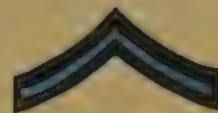
Drum Major.



Sergeant.



Corporal.



Good Conduct Badge.

## DISTINCTIVE BADGES FOR N.C.O.s. AND AIRMEN.

Airmen of R.A.F.  
Bands.Physical Training  
Instructor.

Leading Aircraftman.



Wireless Operator.



Air Gunner.

Apprentices and  
Boy Entrants.

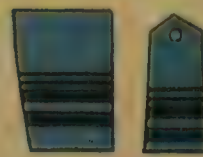
## DISTINCTIVE MARKS OF RANK ON SHOULDER-STRAPS AND SLEEVES OF OFFICERS.

Marshal of the  
Royal Air Force.

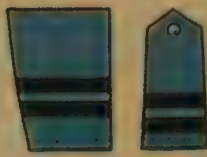
Air Chief Marshal.



Air Marshal.



Air Vice-Marshal.



Air Commodore.



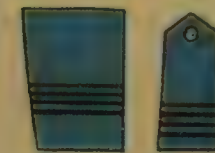
Group Captain.



Wing Commander.



Squadron Leader.



Flight-Lieutenant.



Flying-Officer.



Pilot-Officer.

## WHO'S WHO IN THE ROYAL AIR FORCE: DISTINCTIVE BADGES AND BADGES OF RANK.

On this page we show the badges of rank and distinctive badges for officers, N.C.O.s., and airmen of the Royal Air Force and some notes on these may be of interest. The Pilot's Badge is awarded to those who have carried out a number of flying tests which include an efficient climb to 15,000 ft. in a Service type of aircraft, remaining there for thirty minutes, and two triangular cross-country flights of 200 miles or more. The Observer's Badge was introduced by the Royal Flying Corps during the war, but its use was discontinued afterwards and it was reintroduced by the Royal Air Force in 1937. It was announced last month that the King had approved the design of

the badge to be worn by officers qualified as pilots in the Fleet Air Arm. This badge consists of wings of gold embroidery with a silver anchor and cable in the centre surrounded by a gold-embroidered wreath and surmounted by a crown. The badge shown above has been superseded and officers of the Air Branch of the Royal Navy will now wear a badge having a capital letter "A" in gold embroidery. The badge for apprentices and boy entrants is worn on the sleeve between shoulder and elbow by apprentices and between elbow and cuff by boy entrants. Officers of the Auxiliary Air Force wear the letter "A" in brass on the lapel of the tunic.



## A TYPICAL TRAINING CENTRE OF THE R.A.F.V.R.: GATWICK AERODROME.



PUPILS AND THEIR MACHINES AT GATWICK AIRPORT: THE AIRCRAFT USED INCLUDE "HARTS," "TIGER MOTHS," AND THE MILES "MAGISTER."



A PRACTICAL DEMONSTRATION OF HOW A PARACHUTE OPENS: PUPILS OF THE R.A.F.V.R. AT GATWICK.

*Continued.*

Squadrons for six months' continuous training. In addition to the Pilot Section, the various branches of the Volunteer Reserve include sections for equipment officers, medical officers, air-gunners, the Aircraft Crew Section for the training of observers and wireless operators, and the Ground Section. A new branch, the Meteorological Section, is being formed in the London Area. Candidates for the Pilot Section must be between eighteen and twenty-five years of age, be

physically fit, and have an education up to the standard of the School Certificate, or the Leaving Certificate in Scotland. Selected candidates are enlisted as airmen pilots with the rank of sergeant, but opportunities exist for promotion to commissioned rank on merit. The initial period of service is five years, and at the end of that period pilots have the opportunity of extending their service. (Photographs by Central Press.)





THE AERO-ENGINE ERECTING SHOP: A DEPARTMENT SPECIALLY BUILT TO ELIMINATE DUST, WITH A FLOORING MADE OF IMPREGNATED WOOD, GLASS WALLS, AND AIR SUPPLIED AT THE CORRECT TEMPERATURE BY AIR-CONDITIONING PLANT; SHOWING "MERLIN" AERO ENGINES IN THE FOREGROUND.



FITTING THE REDUCTION-GEAR UNIT AND AIRSCREW SHAFT TO "MERLIN" ENGINES: A PHOTOGRAPH SHOWING THE ROBUST GEAR-TEETH, ESSENTIAL FOR TRANSMITTING THE ENGINE-POWER TO THE AIRSCREW-SHAFT, ON THE EXTREME LEFT, AND, IN THE BACKGROUND, MEN ENGAGED ON REAMING THE MAIN BEARINGS.

#### A VITAL FACTOR IN THE GROWTH OF THE ROYAL AIR FORCE: THE ROLLS-ROYCE "MERLIN" AERO ENGINE WHICH IS

Power for speed must be compact power. High performance, whether in fighter or bomber, demands an engine which presents as small a frontal area as possible, so as to obtain the streamlined body which goes with low drag and easy movement through the air. The Rolls-Royce "Merlin" engine will deliver 1030 brake-horse-power at a height of 16,250 feet, yet it presents a frontal area of only 5.85 square feet. The close "V" arrangement of the twelve cylinders, the manner in which components such as the carburettor

and magnetos are tucked away, and the use of liquid cooling with ducted radiator, all contribute to give high output for a low frontal area. The ducted radiator is particularly well worth noting, for it enables the process of keeping the engine cool to be done without producing extra drag. Moreover, the use of liquid cooling gives control of engine temperature, a matter of importance in aircraft-like fighters, which may have to make drastic changes of height in a very short space of time. Full supercharging is used



THE STRIP-INSPECTION DEPARTMENT: A SECTION OF THE ROLLS-ROYCE WORKS WHERE, AFTER ENDURANCE TESTS, ALL ENGINES ARE DISMANTLED, AND THE PARTS ARE SUBMITTED TO APPROVED INSPECTORS—ALL STEEL PARTS BEING MAGNETICALLY INSPECTED AND ALUMINIUM PARTS CHALK-TESTED.



ANOTHER SECTION OF THE AERO-ENGINE ASSEMBLY DEPARTMENT: THE FINAL STAGE IN THE PRODUCTION OF THE "MERLIN"; SHOWING THE NEW TYPE OF TURNOVER TRESTLE, WITH THE DETACHABLE HALVES REMOVED, WHICH ENABLES THE WORK TO BE CARRIED OUT WITH THE MINIMUM OF DELAY IN HANDLING THE ENGINES.

#### FITTED TO HIGH-SPEED FIGHTERS AND BOMBERS, SHOWING THE METHOD OF CONSTRUCTION THAT ENSURES RELIABILITY.

In the standard "Merlin II." engine, and the "Merlin X." employs a two-speed supercharger which gives a good combination of high performance both at low and high altitudes, and also contributes to improved fuel economy when cruising. Structurally, the "Merlin" is based on previous Rolls-Royce practice, suitably modified for high-duty aero-engine work. The crankcase is an aluminium casting made in halves bolted together: the crankshaft is a one-piece forging in steel, and is carried in seven lead-bronze bearings:

the connecting-rods are nickel-steel forgings; forged aluminium alloy pistons are used, and the cylinder-blocks are aluminium castings. The engine's capacity is 27 litres. Trustworthiness and long service are built into it during the Rolls-Royce process of fabrication, but its special suitability for high-performance military aeroplanes lies primarily in its compactness, and therefore in its extremely low drag for its power. The "Merlin" is fitted to the "Spitfire" and "Hurricane" fighters.





THE TRAGEDY OF THE "THETIS"—THE WORST BRITISH SUBMARINE DISASTER SINCE THE WAR, INVOLVING THE LOSS OF 99 LIVES, OCCURRED ON JUNE 1, WHEN THE "THETIS," WHICH WAS CARRYING OUT ACCEPTANCE TRIALS IN LIVERPOOL BAY, FAILED TO RETURN TO THE SURFACE AFTER DIVING. AN ATTENDANT TUG REPORTED HER FAILURE TO REAPPEAR AND A SEARCH FOR THE VESSEL

began. At 7.50 the next morning the stern of the "Thetis," projecting some 18 ft. above the surface, was sighted by the destroyer "Brazen" in 22 fathoms of water twenty-five miles off Point Lynas. It was reported that the crew of the submarine had signalled by tapping that all were alive, and later four

men escaped by using the Davis apparatus and were picked up by ships' boats. At high tide the stern of the submarine was submerged and failed to reappear, as anticipated when the tide slackened at 6 p.m. No further escapes were made with the Davis apparatus, and it was thought that the hatches had

OF 99 LIVES: A RATING RETURNING TO A WHALER AFTER SECURING A HAWSER TO THE PROJECTING STERN WHILE SHIPS' BOATS STAND BY READY TO PICK UP SURVIVORS USING THE DAVIS ESCAPE APPARATUS.

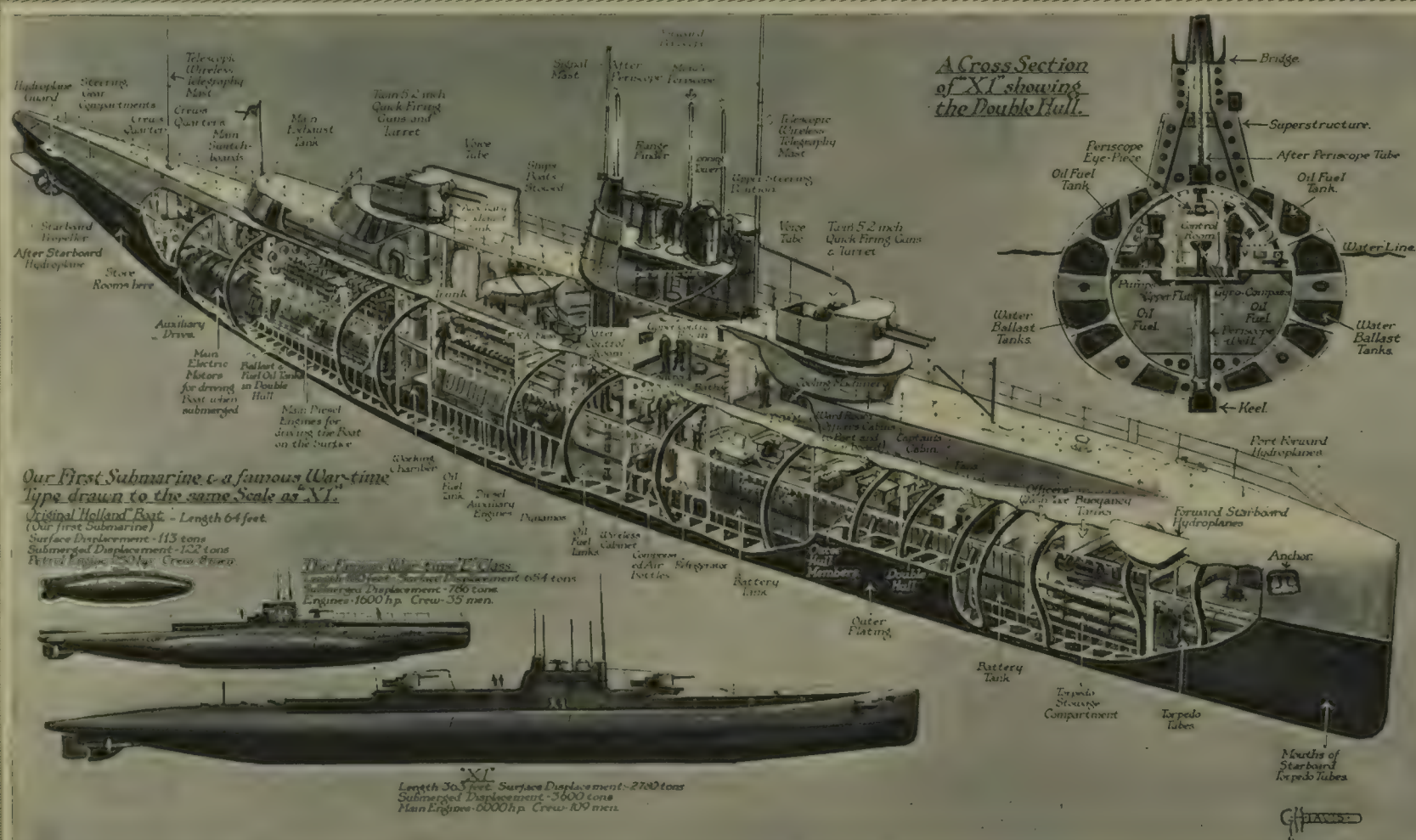
become jammed. Attempts were made to raise the stern with pontoons, but without success, and all hope of rescuing the men in the submarine was officially abandoned on June 3. Besides her officers and men, the "Thetis" carried a number of Cammell Laird representatives. (Keystone)



THE TRAGEDY OF THE "THETIS"; THE INTERIOR OF A SUBMARINE.



THE LOST "THETIS": THE NEW 1095-TON SUBMARINE AT THE WORKS OF HER BUILDERS, MESSRS. CAMMELL LAIRD, WHERE CAREFUL DIVING TESTS WERE MADE BEFORE SHE SAILED ON HER ACCEPTANCE TRIALS. (Topical.)



WHAT THE INTERIOR OF A BRITISH SUBMARINE IS LIKE: SECTIONAL DRAWINGS OF THE "XI" (A VERY LARGE EXPERIMENTAL BOAT BUILT SOON AFTER THE WAR) WHICH ENABLES AN IDEA TO BE FORMED OF THE FLIGHT OF THE CREW TRAPPED IN THE "THETIS."

The submarine "Thetis" belongs to the latest class of large submarine built for the Royal Navy. She was the second of the class to be laid down and launched; being only preceded by the "Triton," built by Vickers-Armstrongs and now serving with her flotilla. As it has often been said that very large submarines are a bad investment, it is worth noting that the "Triton" class are far from being the largest submarines in the Navy. The "Thetis" had, of course,

been fully tested before she went to sea. She had been previously dived twice in Messrs. Cammell Laird's basin, and careful steps had been taken to ensure that she was properly ballasted on her trials. In our lower illustration we show interior sections of a British submarine (the "X1") both longitudinal and transverse. To appreciate the case of the "Thetis," the submarine must, of course, be imagined tilted up at a steep angle, with her bow on the bottom.



THE DAVIS ESCAPE APPARATUS THAT SAVED FOUR FROM THE "THETIS."



**1** AFTER ONE MAN HAS ESCAPED THE HATCH IS CLOSED & THE ESCAPE-LOCK QUICKLY EMPTIED. THE INNER DOOR IS THEN OPENED & THE NEXT MAN ENTERS.

**2** THE INNER DOOR IS CLOSED & THE LOCK FLOODED. THE MAN INSIDE LETS OUT THE LOCKED AIR TO EQUALISE THE PRESSURE WITHIN & WITHOUT & PUSHES THE HATCH OPEN.

**3** THE MAN NOW CLIMBS PARTLY OUT, INFLATES HIS ESCAPE-APPARATUS & COMMENCES TO ASCEND.

BOX FOR STOWING ESCAPE APPARATUS FOR 6 MEN; ONE OF A NUMBER OF SUCH BOXES IN THE SUBMARINE.

HOW THE DAVIS ESCAPE APPARATUS WORKS: MEN ENTERING THE SPECIAL LOCK IN THE SUBMARINE, WHICH MUST BE FILLED WITH WATER BEFORE THE ESCAPE HATCH CAN BE OPENED AND THE MEN RISE TO THE SURFACE.

The Davis submarine escape apparatus, the working of which is illustrated on this page, appears to have played its part well when the first two survivors escaped from the "Thetis." According to a statement made by Mr. R. S. Johnson, managing director of Cammell Laird, however, three of the men who attempted to follow Captain Oram and Lieutenant Woods were taken back into the submarine dead. "Whether

they died from heart failure, or whether they were drowned," said Mr. Johnson, "we do not know. I understand from those who have escaped that it is alarming when you get into this chamber and feel the water rising gradually." It will be recalled that a number of men successfully escaped from the submarine "Poseidon," when she sank in June 1931, by using the Davis escape apparatus.





THE TRAGEDY OF THE "THETIS"—THE SCENE OF THE DISASTER IN LIVERPOOL BAY: A PHOTOGRAPH SHOWING (CENTRE) SIXTH DESTROYER FLOTILLA ON THE LEFT AND H.M.S. "BRAZEN," A TUG AND

As soon as the Admiralty had been informed that the submarine "Thetis" had disappeared while on acceptance trials, the 6th Destroyer Flotilla, the 1st Mineweeper Flotilla, the submarines "Cachalot" and "Narwhal," and the cruiser "Belfast" were ordered to proceed to Liverpool Bay. Meanwhile eight Royal Air Force aircraft searched the sea for signs of the missing

submarine. It was an alman who first sighted the marker-buoy sent up from the "Thetis," and the destroyer "Brazen" was the first ship to reach the spot. Tugs, the salvage-ship "Salvor," and the Mersey Docks and Harbour Board's vessel "Vigilant" were sent out from Liverpool and soon there was a circle of ships round the projecting stern of the "Thetis." The "Vigilant"

WHALERS AND MOTOR-BOATS CIRCLING ROUND THE STERN OF THE VESSEL, WITH THE FLOTILLA LEADER OF THE MERSEY DOCKS AND HARBOUR BOARD'S SALVAGE-SHIP "VIGILANT" ON THE RIGHT.

was employed in trying to raise the stern to enable a hole to be cut in the hull, but she was not successful. On June 4 the Admiralty issued the following statement: "Salvage work on H.M.S. 'Thetis' is proceeding, but it may be some little time before the vessel can be brought to the surface. Messrs. Cammell Laird and Co. will be responsible for the work from now onwards,

but H.M.S. 'Tedworth,' diving-school tender, H.M.S. 'Hebe' and H.M.S. 'Seagull,' with officers of the Submarine Service, will remain on the spot to render any assistance or advice required by the firm." It was announced that the "Thetis" would be lifted with pontoons and beached in shallow water, and later will be towed to Birkenhead. (Keystone.)



THE TRAGEDY OF THE "THETIS": A DRAMATIC SERIES OF PICTURES.



AN ATTEMPT TO RAISE THE STERN OF THE "THETIS": THE "VIGILANT" STANDING BY WITH A HAWSER ATTACHED TO THE SUBMARINE. (Keystone.)

THE "VIGILANT" STILL ATTACHED BY A HAWSER TO THE "THETIS," HAS HER OWN POWER SUPPLEMENTED BY THAT OF TWO TUGS. (A.P.)

THE Prime Minister made a statement in the House of Commons, on June 5 about the disaster to the submarine "Thetis." He said: "It is evident that the accident occurred when she was submerged. So far as can be ascertained, the sinking was caused by the flooding of the two forward compartments through one of the bow torpedo tubes. The rear door of one of these tubes became open, or was opened for reasons which cannot be fully explained. The men in escaping from the compartment were unable in the time available to close the first water-tight door behind them . . . but flooding was restricted to the second compartment. The main ballast tank was emptied, but the submarine continued to dive and struck bottom in about 130 ft. of water. The impact on the bottom destroyed the submarine's signalling apparatus, and

(Continued below.)



THE CRITICAL MOMENT OF THE RESCUE OPERATIONS: THE SUBMARINE APPEARS TO RISE IN THE WATER AS THE TUGS STEAM AHEAD. (A.P.)



AS THE "THETIS" CANTS OVER AND SETTLES DOWN AGAIN, THE "VIGILANT" STOPS HAULING ON THE HAWSER. (A.P.)



A NAVAL OFFICER CLIMBS ON TO THE STERN OF THE WRECKED SUBMARINE TO MAKE AN INSPECTION. (A.P.)

she was unable to communicate with surface vessels." Our photographs show stages in rescue operations which were carried out on June 2. "Vigilant" attached a hawser to the submarine's stern and attempted to raise it

(Continued opposite.)



THE TRAGIC END TO THE ATTEMPT TO RAISE THE "THETIS": THE HAWSER PARTS AND THE STERN IS SWEEP UNDER BY THE STRONG TIDE AND FAILS TO REAPPEAR AT LOW WATER. (A.P.)

sufficiently high above the water to enable a hole to be cut in the hull. Unfortunately, the stern canted over, the hawser parted, and the strong tide at high water swept it under the surface. It did not reappear at low water as expected.



# THE TRAGEDY OF THE "THETIS"—ASHORE AND AFLOAT: ANXIOUS CROWDS IN BIRKENHEAD AND RESCUE EFFORTS IN LIVERPOOL BAY.



"A WONDERFUL EXAMPLE OF THE COURAGE OF A SAILOR'S WIFE": MRS. BOLUS, WIFE OF THE COMMANDER OF THE "THETIS," COMFORTING WOMEN AND CHILDREN AT BIRKENHEAD. (A.P.)



(LEFT.) THE BUOY MARKING THE SPOT WHERE THE "THETIS" LAY SUBMERGED. (Keystone.)



PUTTING DOWN A MARKER-BUOY WHEN THE STERN OF THE "THETIS" BECAME SUBMERGED AT HIGH-WATER: A LAUNCH AND A SMALL BOAT AT WORK OVER THE WRECKED SUBMARINE. (Fox.)



WAITING ANXIOUSLY FOR NEWS OF THE CREW OF THE WRECKED SUBMARINE: A SECTION OF THE CROWD OF 4000 PEOPLE WHO GATHERED OUTSIDE CAMMELL LAIRD'S SHIPYARD BEFORE HOPE WAS ABANDONED. (Fox.)



THE ATTEMPT TO RAISE THE STERN OF THE "THETIS" ABOVE WATER: TUGS TOWING "CAMELS," OR PONTOONS, TO THE SCENE OF THE DISASTER, WHERE THE STRONG TIDE PREVENTED THEIR IMMEDIATE USE. (A.P.)



RESCUING ONE OF THE FOUR SURVIVORS OF THE "THETIS" DISASTER: A BOAT FROM THE DESTROYER "BRAZEN" (SEEN IN BACKGROUND) LIFTING THE EXHAUSTED MAN FROM THE WATER AFTER HIS ESCAPE BY DAVIS APPARATUS. (A.P.)



FACING THE LONG HOURS OF WAITING WITH COURAGE: RELATIVES OF MEN ABOARD THE "THETIS" AT CAMMELL LAIRD'S SHIPYARD, WHERE MANY KEPT CEASELESS VIGIL WHILE HOPE REMAINED THAT THE CREW WOULD BE RESCUED. (Wide World.)

While every effort was being made to rescue the crew of the wrecked submarine "Thetis," relatives of the men aboard her kept ceaseless vigil at Cammell Laird's shipyard, and when at last an official announced that there was no hope for those remaining trapped in the vessel women wept at the tragic climax to the agony of prolonged tension. The conduct of Mrs. Bolus, wife of the commander of the "Thetis," was described by an official of Cammell Laird as "a wonderful

example of the courage of a sailor's wife," for she went about encouraging the relatives of those aboard the submarine, and took many of the women to their homes in her car so that they could rest before resuming their vigil. Four men escaped, using the Davis apparatus, and the "Brazen" signalled to the "Thetis" that they had been rescued by dropping detonators—a method often employed to communicate with submerged submarines.



# OUTSTANDING NAMES FROM THE NEWS OF THE WEEK :



**COMMANDER R. G. B. HAYTER.**  
Lost in the "Thetis." A submarine specialist, who had been serving on the staff of the Director of Naval Equipment.



**LIEUT.-CMDR. R. N. GARNETT.**  
Lost in the "Thetis." Commander, H.M. Submarine "Taku," sister-ship of "Thetis," building at Birkenhead.



**LIEUT.-CMDR. T. C. C. LLOYD.**  
Lost in the "Thetis." Commander of the "Trident," the "Thetis's" sister-ship, now completing.



**SIR HENRY NORMAN.**

Died June 4; aged eighty. Was a distinguished pioneer in the early days of wireless telegraphy, performing valuable technical and administrative work in that field. Was also an M.P. for nearly a quarter of a century. In 1916 became Liaison Officer between the Ministry of Munitions and the Ministry of Inventions, Paris. Was also a versatile author.



**GEN. SIR EDMUND IRONSIDE.**  
Appointed to the revived post of Inspector-General of Overseas Forces, with effect from July 1. Previously was Governor and C-in-C. of Gibraltar. His new post means that he will be *de facto* C-in-C. of the Army under Viscount Gort. Is aged fifty-nine.



**LIEUT. F. G. WOODS.**  
A survivor from the "Thetis." His condition necessitated his entering a hospital in Liverpool.



**LIEUT.-CMDR. G. H. BOLUS.**  
The commander of the "Thetis," who was lost in the disaster. Had served in submarines for 15 years.



**LEADING STOKER ARNOLD.**  
A survivor from the "Thetis." He and Mr. F. Shaw were the last to reach the surface.



**AT BIRKENHEAD AFTER THE "THETIS" DISASTER:** CAPTAIN ORAM (CENTRE), THE SENIOR SURVIVOR; WITH REAR-ADMIRAL FRASER, THIRD SEA LORD (LEFT, FACING CAMERA), AND MR. R. S. JOHNSON, MANAGING DIRECTOR OF MESSRS. CAMMELL LAIRD, BUILDERS OF THE SUBMARINE (RIGHT).

Captain Oram, Commander of the flotilla which the "Thetis" was destined to join, was in her for her trials. When the submarine was involved in the disaster he, with great courage, undertook to ascend to the surface, although no ship was known to be near. His position made him specially qualified to direct the salvage operations. Lieutenant Woods came to the surface at the same time. Rear-Admiral B. A. Fraser, the Third Sea Lord, left London for Birkenhead on June 3. Captain Oram travelled to London on June 4 to report to the Admiralty.



**SIR PHILIP SASSOON.**

Died on June 3; aged fifty. Sir Philip had twice been Under-Secretary of State for Air, and since 1937 was First Commissioner of Works. In 1932 was appointed Chairman of the National Gallery Board of Trustees. His death cuts short a political career which offered yet greater promise, and removed from social life a notable host and a well-known patron of the arts.



**LT.-GEN. SIR WILLIAM MARSHALL.**

Died on May 29, aged seventy-four, after a distinguished military career. Although gazetted a Brevet Lieut.-Colonel for brilliant service in the South African War, he only came before the public eye in the Great War, when Gallipoli and Mesopotamia revealed in him a commander of unusual ability. In 1929 he published his "Memoirs of Four Fronts."

# SURVIVORS AND VICTIMS OF THE "THETIS" DISASTER.



**LIEUT. H. CHAPMAN.**  
Second-in-command of "Thetis," lost in the disaster. Entered Submarine Service, 1933, and served in "L54," the "Parthian" and the "Seahorse."



**STOKER W. T. HOLE.**  
Lost in the "Thetis." Is believed to have died while attempting to leave by the Davis escape hatch.



**LIEUT. P. E. J. RYAN.**  
Lost in the "Thetis." Second-in-command of the "Trident," a sister-ship of the "Thetis."



**GEN. SIR WALTER MERVYN ST. GEORGE KIRKE.**

Appointed to the revived post of Inspector-General of Home Forces, with effect from July 1. Had been Director-General of the Territorial Army since 1936. Was Deputy-Chief of the General Staff in India, 1926-29. Is aged sixty-two.



**LT.-GEN. SIR CLIVE LIDDELL.**

His appointment as Governor and C-in-C. of Gibraltar was announced on May 31. Since the war has been General Staff Officer; Brigade Commander; and Divisional Commander. Was appointed Adjutant-General to the War Office in 1937. Is aged fifty-six.



**LT.-GEN. SIR ROBERT GORDON-FINLAYSON.**

His appointment as Adjutant-General to the Forces was announced on May 31. Has commanded the British Forces in Egypt since April 1938. Served in India as Commander, Rawalpindi District, 1931-34. Is aged fifty-eight.



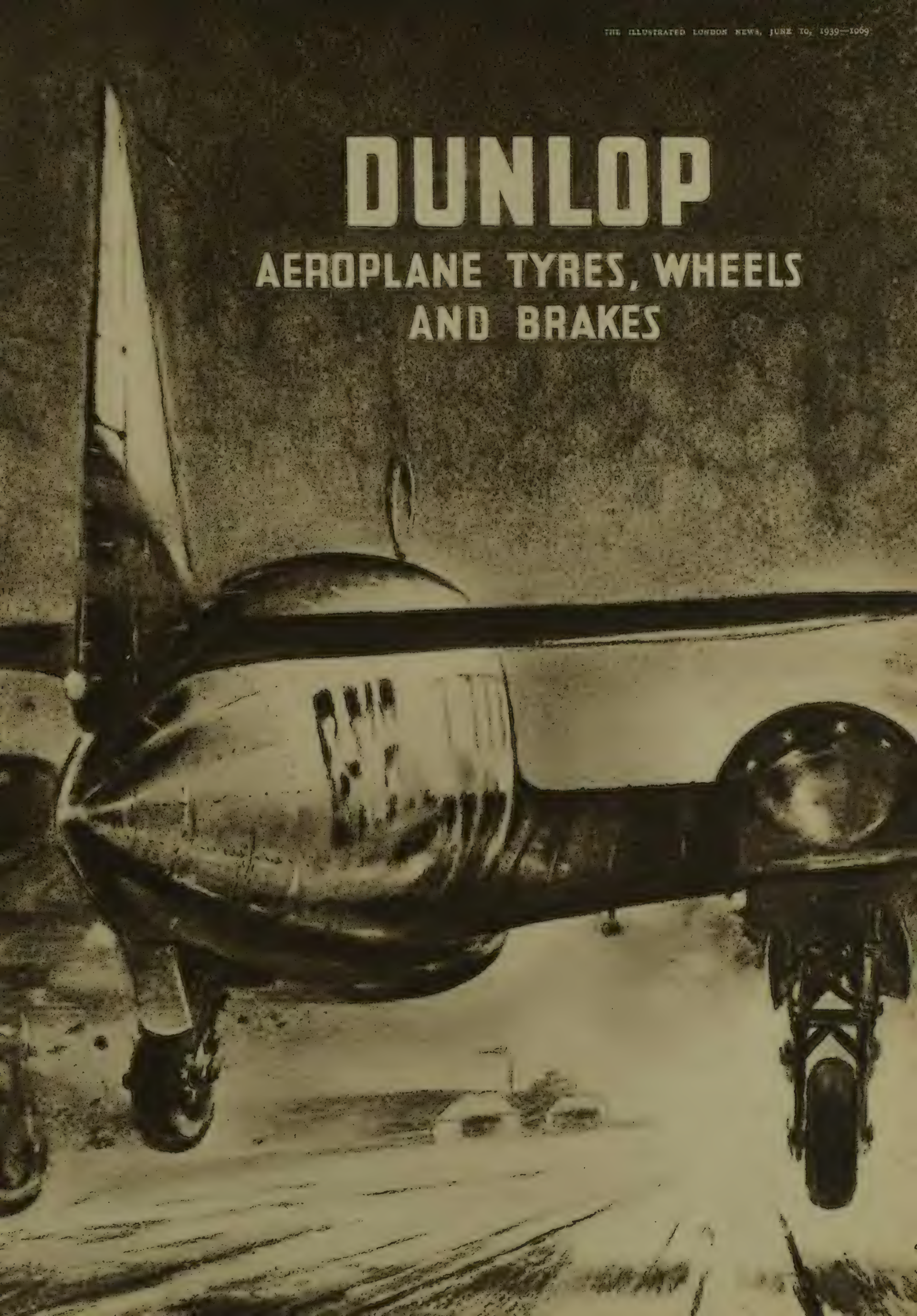
**LT.-GEN. W. D. S. BROWNRIGG.**

His appointment as Director-General of the Territorial Army was announced by the War Office on May 31. Has had much experience of the Territorial Army, both as a Brigade Commander and as Commander of the 51st (Highland) Division. Is aged fifty-three.



# DUNLOP

## AEROPLANE TYRES, WHEELS AND BRAKES





## A PICTORIAL RECORD OF NEWS EVENTS: THE ROYAL TOUR; A DISASTER AND A FIRE-FIGHTERS' REVIEW.



THEIR MAJESTIES REST IN THE ROCKY MOUNTAINS: THE KING AND QUEEN WITH MR. MACKENZIE KING AT THE BANFF SPRINGS HOTEL. (P.N.A.)

The King and Queen arrived at the Rocky Mountains resort of Banff on May 26 and were able to enjoy a brief rest of thirty-six hours entirely free from official engagements. On the following morning their Majesties climbed Tunnel Mountain, a 5540-ft. peak, and in the afternoon went for an eight-mile "buggy" ride. On May 28 the royal party drove to Lake Louise, and later rejoined the royal train at Field to continue their journey to Vancouver and Victoria.



THE EXPRESS WRECKED AT HILGAY FEN STATION BY A COLLISION WITH A LORRY AT THE LEVEL-CROSSING SEEN, IN THE DISTANCE; THREE BEING KILLED. (Fox.)

Three people were killed and seven injured when an express from Hunstanton to Ely struck a motor lorry on a level-crossing while approaching Hilgay Station, near Downham Market, Norfolk, on June 1. The engine was derailed as were five following coaches, the latter striking stationary freight wagons on a siding. It was astonishing under the circumstances that both the driver of the lorry, the driver of the locomotive, and the fireman escaped with injuries.



EXTINGUISHING A BLAZING WOODEN TOWER: THE SPECTACULAR FINALE TO THE HYDE PARK FIRE-FIGHTING DISPLAY REVIEWED BY THE DUKE OF KENT. (L.N.A.)


On June 3 the Duke of Kent, accompanied by the Duchess of Kent, reviewed the London Fire Brigade and London Auxiliary Fire Service in Hyde Park, where they saw a thrilling display of fire-fighting. The Duke and Duchess were received by Mrs. E. M. Lowe, the chairman of the L.C.C., and other officials. The most spectacular item on the programme was the firing of the 50-ft. high wooden tower, which had previously been used for demonstrating rescue work. When the fire was well ablaze 32 trailer-pumps manned by auxiliaries sped on to the ground. Soon dense smoke replaced



A SCENE AT THE FIRE-FIGHTING DISPLAY IN HYDE PARK: THE DUCHESS OF KENT GREETING A WOMAN MEMBER OF THE AUXILIARY FIRE SERVICE. (Keystone.)

the flames, and the fire was under control. Afterwards a charred shell was all that remained of the tower. A great crowd was present in Hyde Park, among whom their Royal Highnesses moved freely about. The democratic way in which members of the Royal Family mingle with the public has only resulted in untoward incidents on very rare occasions. An alarming incident, however, occurred on June 5, when a shot was fired as the Duchess of Kent entered her car in Belgrave Square. She was in no way injured, and, indeed, did not even know that the shot had been fired till later.





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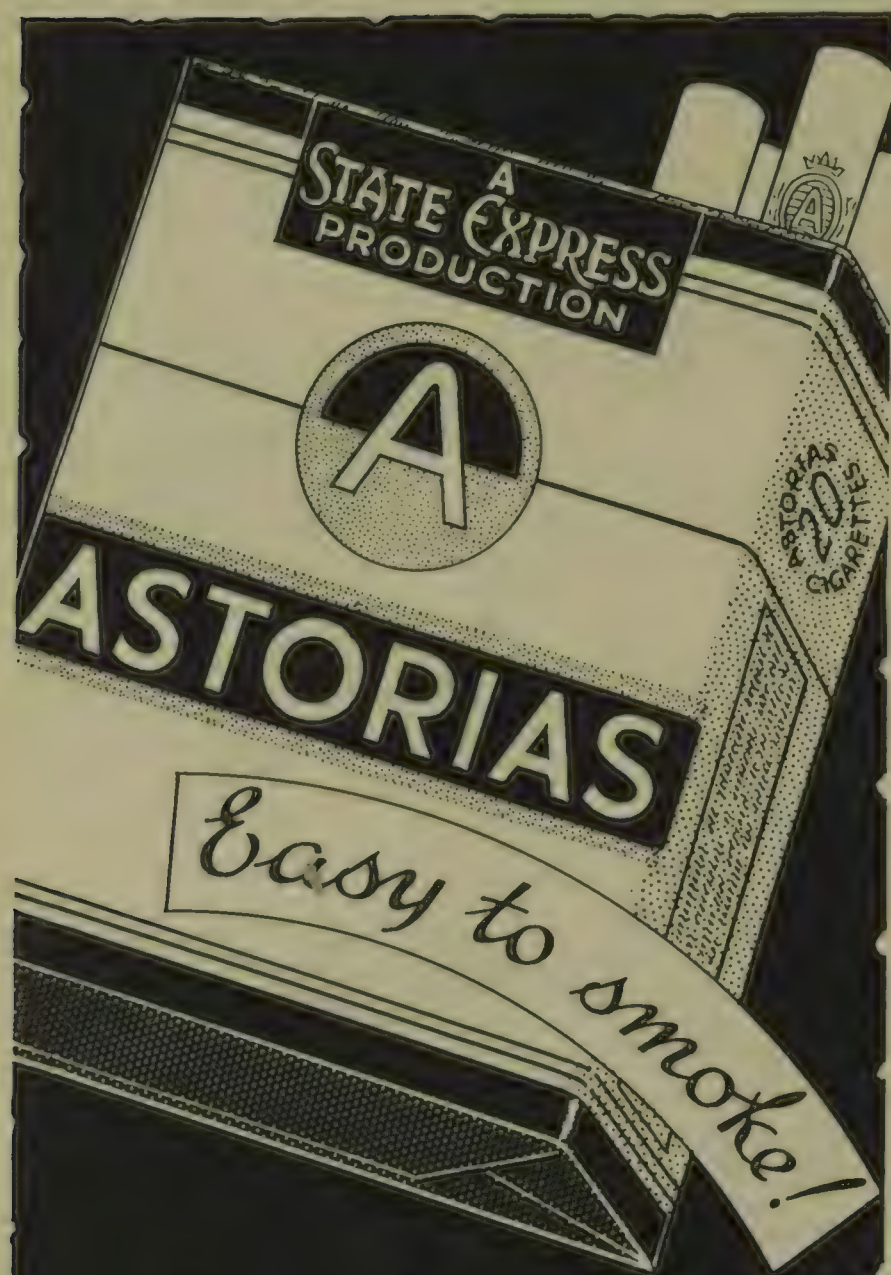
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## THE WORLD OF THE KINEMA.

By MICHAEL ORME.

WITH the moving-picture on the very threshold of its first jubilee, it is no less than fitting that Mr. Cecil Blount De Mille, producer-director of the first feature-length picture in Hollywood, should open the celebrations, as it were, with his sixty-fifth picture, "Union Pacific." For the veteran film-maker, to whose own "silver jubilee"—the screen—I paid my tribute in these pages in February of last year, remains a powerful figure in the world of the kinema. In a sense, he bridges the fifty years of the greatest mass entertainment the world has ever known. Making use of the immense technical advance of the industry, he remains true to the grand manner of the old silent days. He is a master showman, working in a medium that lends itself *par excellence* to showmanship, a medium that sets no limits to his exuberant imagination or to his fine flair for the spectacular. He brings, too, the emotional and dramatic directness of the era before the "talkies" back to the screen of to-day. For on the foundations of historical fact that have always furnished him with the sweep and scope of subject in which he feels at ease, the fictional super-structure he erects is never complex. It could not well be complex, since it has to fit into the elaborate—sometimes opulent, always largely conceived—spectacle of the big show. Therefore, frank sentiment, forthright humour, the black of vice and the white of virtue colour the flags that Mr. De Mille waves with such untiring zest over the crowded battlefields and the pageantry of his super-productions.

Mr. De Mille's characters—emperors, crusaders, pirates, cowboys and the rest—have always seemed to me to stand out clearly from his stupendous backgrounds, a trifle over life-size, undoubtedly and of necessity, tremendously heroic or incredibly villainous, but strongly outlined. Yet I have heard it said that on occasion both story



"UNION PACIFIC," WHICH COMMENCED ITS RUN AT THE PLAZA ON MAY 26: REDSKINS AMBUSHING A DERAILED TRAIN IN A SCENE FROM CECIL B. DE MILLE'S "EPIC" OF THE BUILDING OF THE FAMOUS TRANSCONTINENTAL RAILWAY.



A DRAMATIC SCENE FROM "UNION PACIFIC": JEFF BUTLER (JOEL MCCREA) IS THREATENED BY DICK ALLEN (ROBERT PRESTON), HIS RIVAL FOR MOLLIE MONAHAN (BARBARA STANWYCK).

"Union Pacific," the sixty-fifth motion-picture of Cecil B. De Mille, is concerned with the construction of the Union Pacific Railway—and such a subject gives full scope to that producer: A love-story runs through the picture, in which Jeff Butler (Joel McCrea) finally, though after considerable difficulties, marries Mollie Monahan (Barbara Stanwyck). The film is reviewed on this page.

and protagonists have been submerged by the mighty waves of spectacle. "Union Pacific" (presented at the Plaza) set me wondering whether the famous director may have been influenced by such strictures. For, to my mind, the case is here reversed. The triangular love-story, involving an engine-driver's pretty daughter, a good young man and a bad young man, assumes large proportions, and is inclined to thrust the important business of railroad-building into the background. When the actual laying of the track, delayed by inimical Redskins and scheming whites, obstructed by nature and interrupted by disaster, does emerge from the welter of a super-Western, it is so packed with energy and so pictorially vivid that one begrudges the time wasted on Mollie Monahan, the railroad equivalent of an army *vivandière*, and her two most dissimilar, though friendly, rivals. "Union Pacific" is, admittedly, a rousing melodrama, a great game of cowboys and Red Indians. It would have been a finer picture if it had stuck, literally, more closely to the rails.

The picture starts out to tell the story of the Union Pacific Railways, destined to link two oceans and to open up the West. There is a rival in the field—the Central Pacific—and working behind the scenes is a crooked financier who intends to cash in on the Central whilst apparently supporting the Union. He employs a gang of gamblers, whose dens of iniquity spring up like mushrooms wherever the forward-thrusting railroad halts. The saloon and its lures, as well as the Indian and his menace, have to be counteracted. So up comes Mr. Joel McCrea, hero of the American Civil War and pillar of rectitude. He gallops alongside the jog-trotting train and jumps from saddle to coach-roof with the greatest of ease! Thenceforward vice and virtue are at grips, trouble-makers and the "trouble-shooter" being plunged in a ding-dong fight whose outcome is a foregone conclusion. One last bullet, intended for Mr. McCrea, but nobly warded off by Mr. Preston (the bad, though finally redeemed, young man), removes the husband and unites the lovers as the Union and the Central tracks are joined by a golden spike.

[Continued overleaf.]



# This England . . .



*Newland Valley from Buttermere, Cumberland*

WHEN few could read and fewer write, men would affix to the record of their declarations or commands a seal—that all might recognise by this sign or picture whence came the document, and its true authority. And when it ceased to be valid—as at death or at the beginning of a reign—the matrix was publicly destroyed. But many lovely seals of the old English corporations are preserved to us and in some sort illustrate the old legal maxim that corporations never die. Thus do we still say that men have “set the seal of approval” upon a thing—as, for example your Worthington. Indeed a fair example this, for here is a beer brewed with traditional skill by an old English corporation—that surely will not die while England lives.





*Continued.*

The conventions of romance and of the Western are scattered in generous handfuls over the length and breadth of the picture. The heroine is Irish and poor Miss Barbara Stanwyck is saddled with a brogue with which she struggles gamely, but not convincingly. Apart from this incubus, she plays with spirit and even with tenderness. Mr. McCrea is manly and monosyllabic—a pattern of unassuming valour and a stalwart champion of law and order. Mr. Robert Preston (who is rapidly coming to the fore and has been assigned an important part in Paramount's "Beau Geste") is gay, impudent and decidedly charming, albeit

the ends of the stuff to their horses' tails and gallop off with the unwinding bolts bumping along in their wake, until the plain is festooned and gigantically beribboned. Such moments are fine and frequent. I could wish that the director had relied on the public's ability to recognise their merit and their purpose at once. His habit of driving every point home by repetition prolongs the picture unduly and weakens the strength of a sensational device. We shall never cease to enjoy the spectacular melodrama for which the screen offers unbounded possibilities, but the growing awareness amongst film-goers does, after all, demand a certain readjustment of its elements and its balance.

It would be true to say of "The Story of Vernon and Irene Castle," at the New Gallery, that, in its own way, it bridges the years, though in a wholly different manner from "Union Pacific." For here is a delightful vehicle for those two essentially modern young people, Miss Ginger Rogers and Mr. Fred Astaire, that gives them every opportunity to delight the eye with their brilliant dancing. But at the same time the picture carries the mind back to the days before the Great War, when Vernon and Irene Castle flashed across the dancing world in their meteoric flight to the pinnacles of fame. At their zenith—and it was swiftly reached—every ballroom owed its new steps to the Castles. Clothes and perfumes, books and cigarettes were named after them, and they left a trail of melody—the famous tunes to which they wedded their evolutions—in their wake. Their romance, all too

It meant an interlude of struggle which the young couple, very sure of their love and of their future, faced with humour. Their chance came at the Café de Paris. Their names were made in a night. By a cruel irony of fate Vernon, who joined the Royal Flying Corps and came unscathed through the horrors of war in France, was killed in avoiding a mid-air collision above the flying-fields of Fort Worth, in Texas.

Mr. Fred Astaire and Miss Ginger Rogers bring to their real-life romance, so skilfully embroidered with the pattern of their dances, a beautiful quality of youthful courage. Fluently directed by Mr. H. C. Potter, this screen-play is as charming in its elegance, as entertaining in its period reproduction, as it is refreshing in its presentation of uncomplicated success based on mutual devotion.



"THE STORY OF VERNON AND IRENE CASTLE," WHICH COMMENCED ITS RUN ON JUNE 3 AT THE NEW GALLERY: FRED ASTAIRE AND GINGER ROGERS IN ONE OF THE PRE-WAR SCENES OF THEIR NEW PICTURE.

"The Story of Vernon and Irene Castle," reviewed on this page, is based on the famous real-life story of the well-known dancers of that name. The story concerns the marriage and rise to fame of Irene Foote and Vernon Castle (Ginger Rogers and Fred Astaire). Then the war comes. Vernon joins the Royal Flying Corps, and is killed, having heroically crashed his machine to avoid a mid-air collision.

given to lawlessness, whilst Mr. Lynne Overman, unimpeded by an outside beard, shoots off his wise-cracks as imperturbably as his gun.

Mr. De Mille has lost none of his mastery of large effects, piling up the excitement of an unruly mob, or a herd of buffaloes, hordes of Indians or train smashes with all his old cunning. He has the inspiration of the born showman. Thus the Indian train-robbers, discovering amongst their loot many bolts of brightly-printed cottons and silks, tie

soon and tragically ended, is simple and straightforward. It has been told with a charming simplicity in the picture. When they first met in New Rochelle, Vernon Castle was a slap-stick comedian and Irene a stage-struck girl. They fell in love, they married, and, encouraged by his wife, Vernon Castle had the pluck—in spite of the ready-made job awaiting him—to hold out for a dancing engagement for the two of them.



A WAR-TIME SCENE FROM "THE STORY OF VERNON AND IRENE CASTLE": FRED ASTAIRE AND GINGER ROGERS DANCING THE "PHANTOM DANCE."



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"Flight" photo.



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## BOOKS OF THE DAY.

By C. E. BYLES.

AS Wordsworth very truly said, "The world is too much with us." Every week brings new shoals of books concerned with politics and war, travel or reminiscences, and there is seldom a chance to devote this page to matters of purely literary appeal. At last, however, I have been able to gather together two or three that provide material for an article. And first, long-suffering reader, it may prove a restful change to "absent thee from" publicity "awhile," and be wafted away on "the viewless wings of poesy," or anon of magical prose, in a wizard volume called "BEHOLD THIS DREAMER." Of Reverie, Night, Sleep, Dream, Love-Dreams, Nightmare, Death, the Unconscious, the Imagination, Divination, the Artist, and Kindred Subjects. By Walter De La Mare. With Coloured Frontispiece by Barnett Freedman (Faber; 21s.).

Through these beguiling pages, with their infinite variety of theme and treatment, the reader may wander at will, like a child picking flowers in a wood, and ever lured onward by the sight of something bigger and better and more beautiful. Before beginning to revel in such delights, however, and having looked only at the book's title, I amused myself by jotting down at random from memory a few items which might be expected to occur in an exploration of dreamland. It was in itself a little exercise in reminiscent day-dreaming. Five minutes or so of cogitation resulted in the following "fourteen points," here set down in the order in which they arose—(1) "We are such stuff as dreams are made on"; (2) "The Dream and the Business"; (3) "A Midsummer Night's Dream"; (4) "A Dream of Fair Women"; (5) "Dream Children"; (6) "I Arise from Dreams of Thee"; (7) "Come to me in my dreams, and then By day I shall be well again"; (8) Pharaoh's dreams; (9) "The Dream of Gerontius"; (10) "The Miner's Dream of Home"; (11) "The Slave's Dream"; (12) Horace Walpole's dream that inspired "The Castle of Otranto"; (13) "And, like the baseless fabric of this vision"; (14) "Alice in Wonderland."

If the volume omits some of these items, that is of no importance, as naturally it was not intended to include every book, poem, or line containing a reference to dreams. The very title of the work, of course, implies a whole range of Biblical allusions, while poems such as "A Dream of Fair Women" are involved in a general statement mentioning Tennyson among the many poets who have adopted the common device of "ascribing a story to a dream." Mr. De La Mare himself emphasises the point that omissions were inevitable. Many are deliberate, and others due to various causes. Thus, for example, he writes: "... Book-makers are restricted even more than is the spirit of man by a horrid necessity called Space; there is a vineyard called copyright: and that reminds one of sour grapes. But apart from these deficiencies, a



THE MASTERPIECE OF THE WEEK (JUNE 8-15) AT THE VICTORIA AND ALBERT MUSEUM: A SMALL BOXWOOD STATUETTE, PRESUMABLY OF A NAVAL DIGNITARY, AND PERHAPS OF THE DUKE OF YORK (AFTERWARDS JAMES II.)

Although by the eighteenth century there was a tendency to emphasise the aspects of curiosity or decoration in small works, in earlier centuries many of the great works of art were directly conceived on a small scale, to be carried out in bronze, ivory or hardwood. The statuette, reproduced above, acquired in 1936 from the late Mr. H. Oppenheimer's collection, offers an admirable example of such work. From the naval medallion and the delightfully carved sea-horses on the pedestal, the portrait must presumably be that of a naval dignitary, a suggestion borne out by the costume and armour. The features are not unlike those of James II. when Duke of York, and it has been suggested that the figure represents the Duke, at the time of his appointment as Lord High Admiral of the Fleet, at the Restoration.

collection of so wide a scope as this, over harvest fields so various and so abundant, could only glean rather than garner."

Mr. De La Mare's enchanting book is more than an anthology—a word which he himself considers inadequate to express its nature. In fact, his own introductory chapter of over 100 pages, "Dream and Imagination," forming Part I., is a brilliant essay that will take classic rank in the literature of the subject. Part II., containing extracts from a multitude of authors, mostly in verse, is classified under 25 more or less fanciful headings, which I at first thought, but mistakenly, corresponded to the sub-heads of the essay. The classification is perhaps somewhat over-elaborated, and at times a little cryptic, but I do not find it easy to follow the author's suggestion and disregard it. Explaining the character of the work, and the way to use it, Mr. De La Mare writes: "The collection of poems and passages in prose that follows may be opened at random, browsed in, and then laid aside, until (as I hope) it is returned to again. It is a hope which may be expressed without presumption, since its editor is responsible only for the choice of its contents and for their arrangement, and that arrangement, although it has been given thought and care, and although it has a definite object in view, can be ignored. . . . This volume is a Survey—a panorama—of a wide theme, endlessly inviting, in much obscure, viewed from many different angles, by many diverse minds, and in different states of the mind. It ranges fitfully over an immense area of human experience; and of speculation concerned with it. Still its area is limited. All that relates in life to broad daylight, to what we call actuality, to the wholly wide-awake and to complete consciousness, is outside its aim, although even 'If seven maids with seven mops had Swept it for half a year,' they would have failed to keep out every trace of that." Later, he repeats his point that the mode of classification is negligible. "Its arrangement is of infinitely less value and importance than what has been arranged. In its course and sequence, it wanders and wavers, shallows and deepens; and this with no more, perhaps, but I hope with no less, excuse than has the Thames for its meanderings from its source to the sea."

It is significant of the extent to which the volume is representative of modern writers, whose work is still in copyright, that the acknowledgements occupy no less a space than seven closely-printed pages. Another characteristic of the book, which was to be expected from one of our finest modern poets, is that "poetry has been its main incentive." Among the older poets, most prominence is given to Shakespeare, Wordsworth, Shelley, Keats, Blake, and Coleridge. Slightly less is the debt owed to Beddoes, Byron, Donne, Drummond, Herrick, Vaughan, Swinburne, Coventry Patmore, Christina Rossetti, and Thomas Hardy. Milton has provided two quotations, Tennyson and Matthew Arnold only one each, and Browning none at all. Of

(Continued overleaf.)



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*Aeroplane photo.*



THE BRISTOL AEROPLANE COMPANY, which is one of the oldest firms in the aeronautical industry, having been founded in 1910, has long been famous for high-performance aeroplanes and high-power aero-engines. At the top of the page is the famous Bristol "Blenheim" the world's fastest medium bomber, and at the bottom are two views, of "Blenheims" in course of erection. Bristol sleeve-valve aero-engines are the only high-powered aero-engines in the world fitted with sleeve valves, and with

even higher outputs than the well-known "Pegasus" and "Mercury" poppet-valve engines, which were chosen for production by the "Shadow" Industry. Bristol engines power large numbers of military aircraft, as well as the entire fleet of Imperial Airways' Empire flying-boats, and the latest civil landplanes. The single-row "Perseus" and double-row "Taurus" engines are shown; with one bay in the Bristol aero-engine works.



*Continued.* numerous modern poets cited, no one stands out from the rest in the matter of quantity. In the introductory essay, however, particular praise is given to Wilfrid Gibson's vivid lines on childhood's fear of the dark; while from the same poet comes a charming sonnet entitled "Tenants," expressing emotions evoked at the sight of a former but forsaken home.

"Very few translations," Mr. De La Mare points out, "find a place [in the collection]. What influence and effect, then, the race or climate or language of the dreamer has on the kind and quality of his dreams, and on similar operations of the mind, is a seductive question that has been left unanswered." That such factors may have a very strong and distinctive influence is manifest in the work

of a famous Spanish poet and dramatist, as represented in "POEMS—F. GARCIA LORCA." With English translation by Stephen Spender and J. L. Gili. Selection and Introduction by R. M. Nadal. Illustrated (The Dolphin; 7s. 6d.). Here is an example of the only form in which verse translations from foreign poetry are ever satisfactory; that is, with the original text printed side by side with the translation. Even those who, like myself, have little Spanish, can perceive that the translators have followed the original very closely, in rhythm as well as diction. The total impression on a British reader is of strangeness mingled with strength. This poetry is at once easy and difficult. The words used, taken separately, are simple enough, but their combined meaning is often hard to understand, and requires some acquaintance with surrealism.

Ostensibly, there seems to be little dreaminess in Lorca's work that might have qualified it for quotation in Mr. De La Mare's volume, but rather a hard, diamond-bright objectivity. Yet one would imagine it otherwise from a reference in the introduction to the work which, in 1928, caused Lorca, like Byron, to awake one morning and find himself famous. "This occurred," we read, "like a flash in 1928 on the appearance of the *Romancero Gitano*, the most widely-read book of Spanish poetry in the present century, winning for its author in Spain and South America a fame exceeding that of any contemporary. . . . The poet starts from an undoubted fact: the existence of an Andalusian gypsy population. . . . The gypsy is transformed into a mythological, heroic being, constantly struggling with, and constantly defeated by, his everlasting enemy, the world of reality. The gypsy is, then, the personification of dream over against reality. This idea is persistent in Lorca. 'Through the olive-grove came the gypsies, bronze flesh and dreaming soul.' Their dreams, apparently, are rather of the nightmare sort. 'Throughout, the ballads are dominated by the atmosphere of night, the obsession of crime and bloodshed: 'The outpoured blood moans its mute serpent song.' This obsession of death and blood, marked from the beginning of his work, was never to abandon the poet.' In the present volume it

appears especially in such poems as the "Ode to the King of Harlem" (a result of his visit to New York) and the "Lament for Ignacio Sanchez Mejias," a lurid elegy on a bull-fighter gored to death in the ring. Not for nothing is Lorca hailed as "the poet of the Spanish people."

Señor Nadal gives an interesting sketch of Lorca's career and personality, his work for the theatre, his visits



ONE OF THE STAR EXHIBITS OF THE ROME ZOO: MARCUS, THE TEN-YEAR-OLD ORANG-UTAN WHICH WAS CAPTURED IN BORNEO AT THE AGE OF FIVE MONTHS. (Wide World.)



ON ARRIVAL AT THE ROYAL ALBERT DOCK, LONDON: CÆSAR, AN ADULT RHINOCEROS DESTINED FOR THE BELLE-VUE ZOO IN MANCHESTER. (Wide World.)

to the United States, Cuba, and the Argentine, and his success as a dramatist with his trilogy of rural life, comprising the tragedies, "Bodas de Sangre," "Yerma," and "La Casa de Bernarda Alba." His own end was tragic, and it would seem that he suffered the fate of the open-minded neutral, the non-party man denounced by Thucydides and exposed to the charge—"He that is not with us is against us." Tracing this last phase of his life, the writer says: "Lorca, who had friends in both camps, was ready with his answer: 'I am an anarchist, communist, libertarian, Catholic, traditionalist, and monarchist,' he would say to cut off conversation on politics. Nevertheless, his name was skilfully traded for political purposes. . . .

*(Continued overleaf.)*



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THE SUPERMARINE "SPITFIRE": A 362-M.P.H. FIGHTER RELYING UPON STRONG, LIGHT "NORAL" ALLOYS TO ENABLE IT TO CARRY ITS ARMAMENT OF FIGHT GUNS AT THIS TREMENDOUS SPEED. ("Flight" photograph.)



ONE OF THE FASTEST AND MOST FORMIDABLE BOMBERS IN THE WORLD: THE BRISTOL "BLENHEIM" IN WHICH "NORAL" "ALCLAD" SHEET IS USED IN EVERY MAIN STRUCTURAL ELEMENT. ("Aeroplane" photograph.)



THE BRISTOL "BOMBAY" BOMBER-TRANSPORT—REQUIRING A SPACIOUS FUSELAGE; IN WHICH "NORAL" "ALCLAD" SHEET IS USED FOR STRENGTH WITH LIGHTNESS AND "NORAL" EXTRUDED SECTIONS IN THE WINGS. ("Aeroplane" photo.)



THE BLACKBURN "SKUA," WHEREIN "NORAL" ALLOYS IN THE FORM OF "ALCLAD" SHEET AND EXTRUDED SECTIONS MEET THE EXACTING DEMANDS OF STRENGTH FOR DIVE-BOMBING, CORROSION RESISTANCE FOR WORK AT SEA, AND THE LIGHTNESS REQUIRED IN NAVY AIRCRAFT. ("Flight" photograph.)



THE HANDLEY PAGE "HAMPDEN," A BOMBER CAPABLE OF BEING RAPIDLY PRODUCED—"NORAL" ALLOYS BEING USED FOR ALL SKIN COVERING AND MAIN-WING EXTRUDED SECTIONS AND CASTINGS. ("Aeroplane" photo.)



THE SHORT "SUNDERLAND": A MACHINE WITH A RANGE OF 2500 MILES, IN WHICH EIGHT TONS OF "ALCLAD" AND "NORAL" PRODUCTS ARE EMPLOYED, GIVING IT GREAT POWERS OF RESISTANCE TO THE CORROSIVE ATTACK OF MARINE AIR. ("Flight" photo.)

The efficiency, and in particular, phenomenal speeds, of modern heavier-than-air machines are largely due to the great development that has taken place in recent years of aluminium alloys. Without the lightness and strength of aluminium, without its freedom from corrosion, and its exceptional formability, it is doubtful whether the Supermarine "Spitfire" could fly at nearly 400 m.p.h. or the Bristol "Blenheim" would be the formidable bomber it is. All the R.A.F. machines illustrated on these pages and many others use large quantities of "Noral" aluminium products in some form or another, such as extruded sections for wing spars, sheet for ribs, skin

coverings and detail parts; high-strength castings for innumerable important members and forgings for airscrews and engine parts. Aluminium has long passed from its apprentice stage in the service of aircraft, and to-day it is used in vast quantities as an indispensable ally in the conquest of the air. Britain is well ahead in the development of aluminium, and it is interesting to see that a great concern like the Northern Aluminium Co., Ltd., of Banbury and Birmingham, maintains a large research laboratory which is constantly improving the properties of "Noral" aluminium products to keep pace with the exacting demands of the Royal Air Force.



*Continued.*

Lorca, like the great majority of Spaniards, had been brought up in Catholic surroundings. . . . His mental background was liberal and he had an innate sympathy for the peasants, for the humble and the fallen whom he unostentatiously helped. In spite of this, reactionary extremists, blind to the meaning of the poet's work, began to attack him on account of the political affiliations of some of the outstanding interpreters of his characters on the stage."

The poet's death was part of the price that Spain had to pay for civil war. "In July [1936], Lorca was due to join his parents for the usual summer stay of the family near Granada. Horror-stricken by a series of political crimes, he hesitated whether to return home or remain in Madrid. He made his decision suddenly, and . . . left for Granada. Two days later the ghastly civil war broke out. In the first days of strife, some Falangistas, intimate friends of the poet and admirers of his work, invited him to their house as a protection against the possible excesses of the moment. Accounts received from trustworthy sources coincide in stating that, taking advantage of the temporary absence of his friends, an armed group whose political filiation, if any, cannot at present be established, entered the house, dragged Lorca away and assassinated him brutally and cowardly on the outskirts of Granada."

Two other notable literary studies deserve more space than I can now give them. In "OLD GODS FALLING," by Malcolm Elwin (Collins; 15s.), the author traces the gradual emancipation of English popular literature from the stranglehold of Victorian prudery. He covers the period from 1887, the year of Queen Victoria's first Jubilee, when Mrs. Grundy was at the height of her power, to 1914, when it was finally broken by the war and its social results. Meanwhile, he shows how novelists were hampered by the arbitrary censorship of circulating libraries; how some, such as George Moore, rebelled; while others, including

Stevenson (largely, it is alleged, through the influence of a censorious wife) suffered frustration from conventional restriction on freedom of expression; and others again, such as W. J. Locke and Rider Haggard, took refuge in compromise. In the closing chapters, on Arnold Bennett and Galsworthy, the idols of a hypocritical epoch are beginning to wobble on their pedestals. Mr. Elwin concludes with an urgent appeal to modern writers to preserve the liberty which their predecessors attained.

"Books," he declares, "are the only comparatively unfettered mediums of expression. . . . Never in the history

let English writers and readers zealously cherish the freedom so long and hardly fought for and won—let there be no return to the irritant vexation of the 'nineties or the arid sterility of the 'eighties. The old gods are fallen, and may they never be reinstated in abominable idolatry!"

No one could ascribe prudery to the author of "Don Juan," and his character is exposed anew, through epistolary revelations by a number of his victims, in a highly piquant volume of letters entitled "TO LORD BYRON." Feminine Profiles based upon unpublished letters, 1807-1824. By George Paston and Peter Quennell. With 12 Illustrations (Murray; 12s. 6d.).

Not the least interesting part of the book is the story of the letters themselves, numbering many hundreds, which Byron had religiously preserved among his "sentimental archives," until they eventually found their way to the House of Murray and were entrusted to the competent editorship of "George Paston" (the late Miss E. M. Symonds). Her work, cut short by death, was continued by Mr. Quennell.

After describing the poet's extensive collection of love relics, such as ringlets of hair kept in "parchment screws," each marked with a name or initial, the writer of the foreword continues: "Of more solid interest . . . are several boxfuls of letters addressed to Byron, written by women who worshipped or desired or thought that they loved him. These letters provide the material of the present volume. They are on every kind of paper and are dashed off in every type of handwriting, from the fine despairing copperplate of Lady Frances Webster to the arrogant scrawl of Harriette Wilson or the half-educated penmanship of Susan Boyce.

. . . No group of women could be more oddly assorted than these great ladies, actresses, blue-stockings and *demi-mondaines*, who wrote to Byron to solicit his interest or implore his love, to remind him of a happy past or to plan for the future. Very different in their characters, tastes and upbringing, they were alike in their electric response to his personal influence."



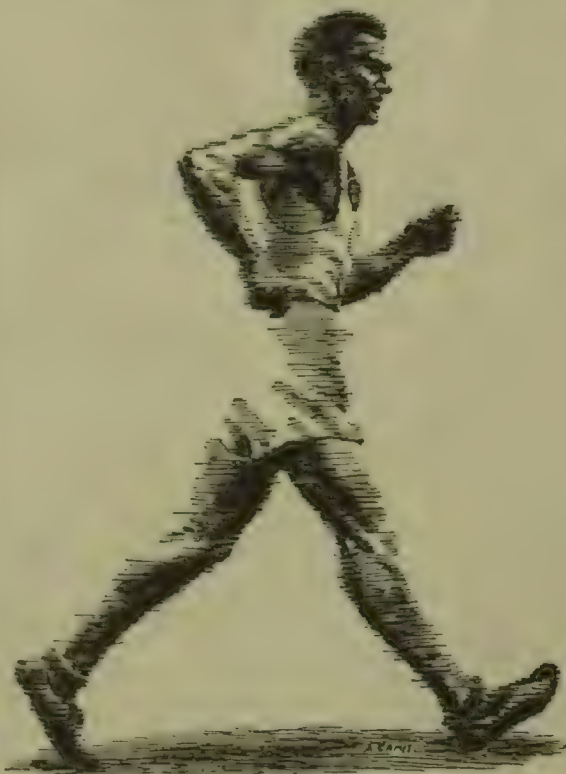
AN INGENUOUS METHOD OF OBTAINING ROWING PRACTICE IN A NARROW SPACE: THE CIRCULAR ROWING-MACHINE INVENTED BY MR. A. A. COFFY, COACH OF THE ASHVILLE SCHOOL FOR BOYS IN NORTH CAROLINA; A GOOD CREW CAN SPIN THE MACHINE AT 35 M.P.H. (*Wide World.*)

of fiction have there been so many competent novelists and novels as in the period since 1918, when the old gods of Respectability, Prudery, and Humbug were overthrown; either the past nineteen years have been 'the golden age of fiction' which Bennett foresaw, or they were the prelude to the golden age. However that may be, the moral emerges in warning, as wholesomely as from a late-Victorian novel:

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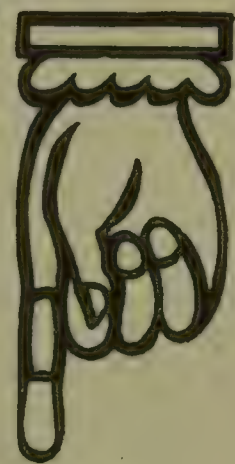


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## THE WORLD OF MUSIC.

### THE GLYNDEBOURNE OPERA.

THE Glyndebourne opera season began on June 1 with Mozart's "Le Nozze di Figaro" in glorious weather. Mr. Christie's beautifully situated opera house is now completed, with all the stage and other additions in perfect working order, and I thought that even an extra degree of smoothness and polish had been achieved in the production of "Figaro."

The first thing that calls for attention is the cast, in which there are some important changes this year. The Countess is a newcomer, Maria Markan, who comes from Iceland, but has had her training on the Continent. She has a beautiful voice and is a most accomplished singer; indeed, from a purely vocal point of view she is the best Countess we have had so far at Glyndebourne. Her singing of "Dove Sono i bei Momenti" was remarkable in its exquisite evenness and purity, and, indeed, the smoothness of her singing calls for the use of one of Mozart's own favourite expressions—"it went like oil." But, as is not infrequently the case with singers who possess a voice of exceptional evenness throughout its range, together with an exquisite technique, she is not a singer of extreme sensibility. This is a dignified and attractive Countess who looks the part perfectly and who acts well, but she did not quite touch the heart. In other words, it is beautiful but not extremely expressive singing.

There was also a new Cherubino, this time from America, Risé Stevens, who has not sung at Glyndebourne before. The most engaging Cherubino of past years at Glyndebourne was Louise Helletsgruber, although she was a little too physically mature for the part. Frankly, I was disappointed with Miss Risé Stevens in the first act. Although very young, she did not look like a youth, owing to her exaggerated facial expressions, and her singing of "Non So Più" had not got the irresistible reckless charm which it should have. In the boudoir scene, however, she completely dispelled all my doubts and reservations. She has quite extraordinary charm and hers was the best acting of the boy blushing masquerading as a girl that I have ever seen in the part. Her voice seems a little on the heavy side for the part, but here again

one lost this impression in the course of the opera, and I think the management is to be congratulated on a new discovery. I look forward to seeing her in other parts, but she is certainly one of the best Cherubinos I have heard.

As Susanna, Miss Audrey Mildmay gave an excellent performance, her singing of her big aria in the last act being particularly commendable for its sustained expressiveness. It would be difficult to find anywhere better exponents of the parts of the Count, of Figaro and of Bartolo than John Brownlee, Mariano Stabile and Salvatore Baccaloni, who were all in splendid voice in their accustomed rôles; but I think Mr. Eric Starling sang Basilio for the first time at Glyndebourne and he is to be congratulated on an admirable performance. Constance Willis, as Marcellina, and Irene Eisinger, as Barbarina, were in their old parts, and added greatly to the quality of the general ensemble by the high standard both of their acting and their singing.

The choruses were good and the ballet in Act III. was more appropriate and pleasing than last year's. Dr. Fritz Busch has welded the Glyndebourne festival orchestra into a fine body of musicians, and the only criticism I have to make of their playing is that the wood-wind occasionally seem rather weak, as, for example, in the overture. Elsewhere also they played at times with rather less than full expression. It was satisfactory to find the opera house full with a most appreciative audience, there being an unusual number of recalls after every act.

At Covent Garden this week "Tristan und Isolde" has been added to the repertory, conducted by Sir Thomas Beecham. The chief feature of this production was the appearance of the French soprano, Germaine Lubin, as Isolde, with Lauritz Melchior, whose Tristan is well known to us. Mme. Lubin's performance was strikingly intelligent. She has a beautiful voice and is an Isolde of rare quality.

W. J. TURNER.

### "RHONDDA ROUNDABOUT," AT THE GLOBE.

"WHAT a magnificent bad play" a first-nighter said as she walked out from the *première*. And the lady, for once, was right. It is a bad play—technically. It has thirteen scenes, and though Motley have so constructed their sets that there is practically

no waiting between each scene, there is lack of continuity. Again, the intervals between each act run to very nearly twenty minutes, which is a long time, unless you happen to be regular first-nighters, gossiping as to who has put the money up for a certain show—and why. On the other hand, this is undoubtedly a good if not a magnificent play. It has been said that Mr. Jack Jones, knowing his Rhondda people, has been able to write about them. This certainly is not true. Most people know their neighbours, but they definitely cannot write about them. Otherwise the bookstalls and theatres would be flooded with books and plays dealing with real life.

Mr. Jones obviously knows the Rhondda Valley people, but he has been blessed with that little gift of picking a character here and there from a mob. That is a gift. If Mr. Jones could only acquire the knack of telling us a story (and that is only a knack) he might become a dramatist whose finger on the bell-push rings in managerial ears. There is very little unity between these thirteen sketches. One never discovers who is the "Charlie" who got a certain young lady into trouble. Nor was it particularly obvious why an English officer, who acted as a sort of Greek chorus, having agreed to make an honest woman of her, abruptly decided to dive into a flooded coal-pit instead.

A very natural touch was the decision to hold the wedding feast in spite of the bridegroom's death. (After all, look you, in the Rhondda Valley a feast is a feast!) Even if one's knowledge of Wales is limited to Llandudno, one can still appreciate the atmosphere. The weariness, misery, and yet jollity of folk living on the bread line comes right over the footlights. Mr. Julien Mitchell gives a great performance as a good-natured bookmaker who bestows hundred pound cheques when drunk, for fear that, when sober, he might add a nought to the figure. There's a fine moment when Mr. Tom Jones, as choir conductor of many years' standing, suddenly fails to remember whether it is "Elijah" or "The Messiah" he is conducting. Mr. Mervyn Johns gives a perfect performance as one of those level-headed men no community could exist without. The captious critic can pick many holes in this play. But those who enjoy a glimpse of life behind the footlights will find this play gives them something to think about as well as entertainment.



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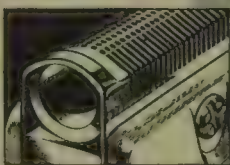
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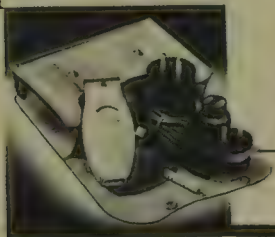


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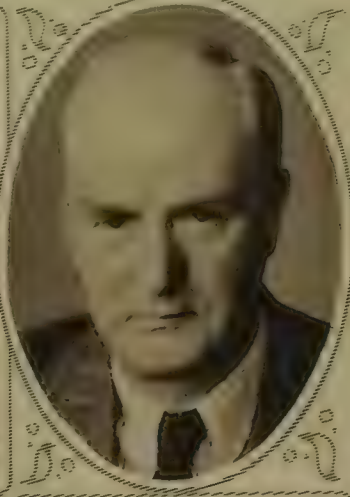
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# Of Interest to Women.



## Tailored Linen Suits.

Tailored linen suits are among the débutantes of fashion, and attention to detail is a fetish where they are concerned. Coats accompanied by striped linen skirts, skilfully pleated, have blouses of organdie to match the stripes. Handkerchief linen is used for other dresses, the colour schemes of which are reminiscent of those which the gypsies favour. Frequently an off-white long coat completes the scheme. Flannel suits are well represented, and an attempt is being made to create a vogue for tailored evening dresses.

## "Fitted" Evening Coatees.

A new line has been introduced in evening coatees. They are fitted, and are so cleverly designed that they completely alter the aspect of a dress, with a square neckline and a draped sash. There are long sleeves and a sliding fastening down the front; the hem of the coatee fits into the folds of the sash, hence it is an integral part of the ensemble. The bustle has resolved itself into soft draperies and so have panniers. Basques are rapidly coming into their own. Nevertheless, they do not fall flat, but are slightly raised over the hips.

## For Country Wear.

A few years ago the fashions on this page would have been considered only appropriate for cruising. Now they are regarded with favour for sports and country wear in general. They may be seen in Harrods (Knightsbridge) pleasant salons. At the top of the page on the left is a practical bather with panties, the coat being lined with towelling, which, as everyone must admit, is a great advantage on chilly days or after the sun has set.



## Trousers Very Important.

Trousers are well represented at Harrods, as they are well-tailored, flattering and practical. The jacket and trousers pictured on the right are available in a variety of pastel colours and in several sizes. Below is an ensemble consisting of blazer, shirt and trousers. In this connection it must be mentioned that there is an infinite variety of woven cotton shirts in glorious colourings for 7s. 6d., and perfectly fitted and cut all-wool flannel slacks, for 20s. Candlewick coats, with full waists and flared skirts, are 37s. 6d. Brassières and trunks make swim suits for 22s. 9d. They are in an all-wool ribbed design.

## Something Different.

The bather has become the foundation, as it were, of smart beach wear, frequently being reinforced with a brassière. Harrods have created the one on the extreme left. Note how perfectly it fits the figure, the scheme being completed with a spotted wrap. It is so decorative that it may do duty as a housecoat. The other outfit consists of shirt and trousers, and as they are not united they may choose different companions should they so desire. An unprecedented and comprehensive collection of hats and shoes—representing the last word in the story of fashion—have been assembled in these salons.





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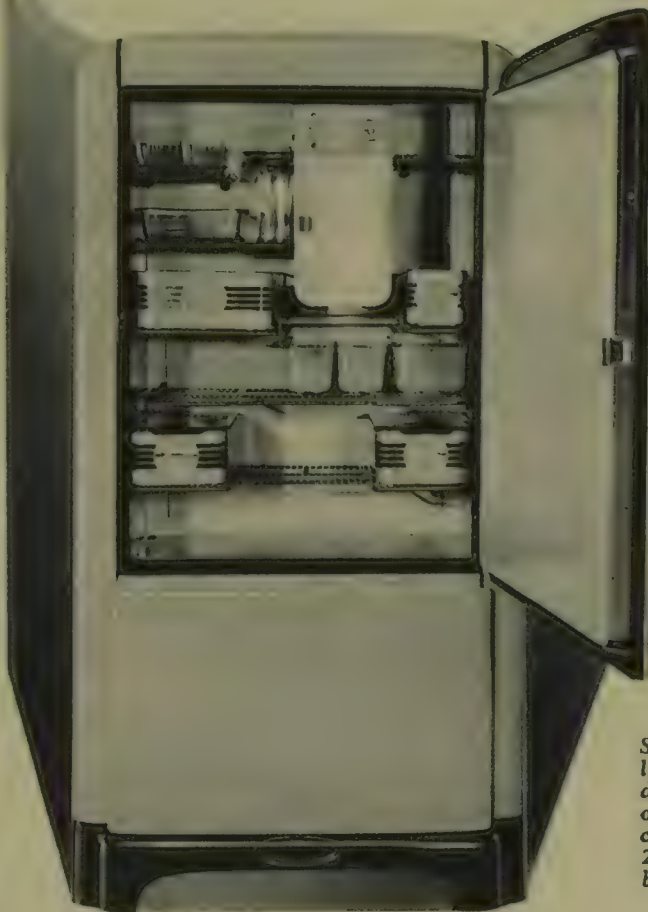
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## THE WORLD OF SCIENCE.

By W. P. PYCRAFT, F.Z.S.

### LIVING MUMMY-CASES.

SOME little time ago one of my neighbour's gardeners brought me a big chrysalis which he had dug up from a large plot where potatoes had been



1. THE CHRYSALIS OF THE BRIMSTONE BUTTERFLY (*GONEPTERYX RHAMNI*): A PHOTOGRAPH SHOWING THE SILKEN LOOP PLACED ROUND THE BODY AND ATTACHED TO THE SAME TWIG AS THE CHRYSALIS, WHICH KEEPS IT IN A HEAD-UPPERMOST POSITION. (ENLARGED.)

growing. I saw at a glance that it was the chrysalis of the great death's-head moth, though, unfortunately, it had been damaged. On re-examination I found myself making a mental comparison between this and those of a number of others of our native moths and butterflies. For though they are—and probably just because they are—"common objects of the country," no one save the expert entomologist seems to know anything about them, not being possessed by that blessed spirit of curiosity which leads men down so many unexplored avenues of thought.

For a chrysalis is really a very wonderful object. And we find, when we come to make comparisons between a number of them, a very remarkable range in the shapes they present and the places where they are found. Most people, at any rate, if shown one will tell you that "it will turn into a butterfly," but it never occurs to them to ask how it turned into a chrysalis! Even the wisest of us have, indeed, still much to learn about this wonderful transformation.

Briefly, its formation started with the caterpillar. Having attained to the limit of its growth and become "full-fed," it seeks retirement for a spell of rest, which, according to the custom of its tribe, may last but a week or two, or may extend over a period even of several years! The caterpillar of the brimstone butterfly, for example, seeks the underside of a leaf or stem of its food-plant—the buckthorn or the berry-bearing alder—and fastens its "claspers" at the end of the body thereto, then, leaving hold with its legs, curves the body, for a moment, away from the branch. But just before this act of suspension it passes a silken thread round the body, attaching the end to its support, as is seen in Fig. 1. This, in itself, is a very wonderful performance. We call it an "instinctive" action. But how came it about? This spinner did not know that this was a most vitally important thing to do, for it is essential that it should sleep, and await its change, with its head pointing upwards. Without that thread it would presently be hanging head-downwards, and that would mean death. And now, having tucked itself up, so to speak, it presently goes to sleep. But in settling down for this sleep the old caterpillar skin is shed and is replaced by the hard case we call the chrysalis. But what an amazing change this frail body has undergone! In a surprisingly short space of time the wings of the future butterfly have appeared, closely

pressed to the sides of the body, and between them on the underside, you may see the legs and the tongue or proboscis closely pressed together. These legs, and the proboscis, are totally new structures, for nothing remotely resembling them is seen in the caterpillar. All that we know of these changes is that, at the end of the caterpillar stage, the tissues of the whole body break up and are replaced by liquid resembling salad cream, and out of this the new miracle is worked!

[Continued overleaf.]



2. HANGING HEAD-DOWNWARDS, IN CONTRAST TO THE BRIMSTONE BUTTERFLY: A CHRYSALIS OF THE SILVER-WASHED FRITILLARY; IN WHICH THE RUGGED OUTSIDE SHAPE AFFORDS AN EFFECTIVE CAMOUFLAGE.



Photo: Aschwanden

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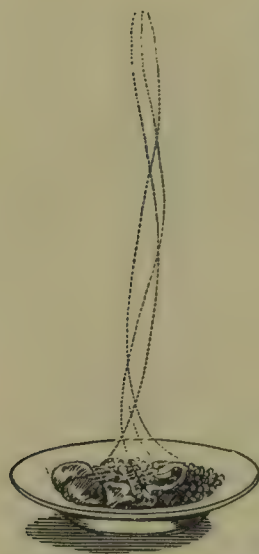
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*Continued*

The shape of this chrysalis is peculiar, for the head-end presents a rough likeness to the head and beak of a bird, while the enlarged wing-cases, leaf-green in colour, give the whole body a resemblance to a curled leaf. The white butterflies and the orange-tip similarly are fastened by a silken thread as they enter the chrysalis stage. But the last-named, like the brimstone, has a remarkable shape, very effectively disguising its true nature. In Fig. 3 the empty case is shown. Escape was made by thrusting up the long, projecting beam running in the opposite direction to the twig to which this shell is attached. The expanded, grooved area below it is formed by the wing, while the rest of the body below this is very twig-like, completing the camouflage.

In the red admiral and tortoise-shell butterflies, and the fritillaries and some others, there is no silken supporting cord, and, in consequence, the case hangs head-downwards. In all, these chrysalis cases are rendered inconspicuous by their rugged shape, as in the silver-washed fritillary for example (Fig. 2), where the under-surface has a sinuous outline beset with spine-like projections.

Among the moths the chrysalis is commonly enclosed within a barrel-shaped silken case, familiar to all who have kept silk-worms. This is spun by the



3. THE STRANGELY DISGUISED CHRYSALIS OF THE ORANGE-TIP BUTTERFLY, RESEMBLING A TWIG RATHER THAN A LIVING BODY; A DEEP GROOVE ON THE UPPER PART MARKING THE LINE OF EMERGENCE.

caterpillar in the form of a thread from glands in the mouth. That thread is continued for many hundreds of yards, till it forms a barrel-shaped chamber enclosing the spinner; and within this the transformation into the chrysalis takes place. This, in itself, is a very wonderful feat, for we can scarcely suppose that the spinner is working with any set purpose or design; that is to say, of "awareness" of what will be the end of this spinning. But more than this. Escape from this enclosed cell must be made when the completion of the evolution of the adult stage—the moth—comes about; yet it has no cutting jaws, enabling it to gnaw a passage. Some achieve this freedom by the secretion of a corrosive fluid, enabling a passage to be pushed through the otherwise unyielding wall; others construct an elaborate arrangement of spines round the mouth of a "doorway" from the tomb. And these spines are all set with their ends pointing



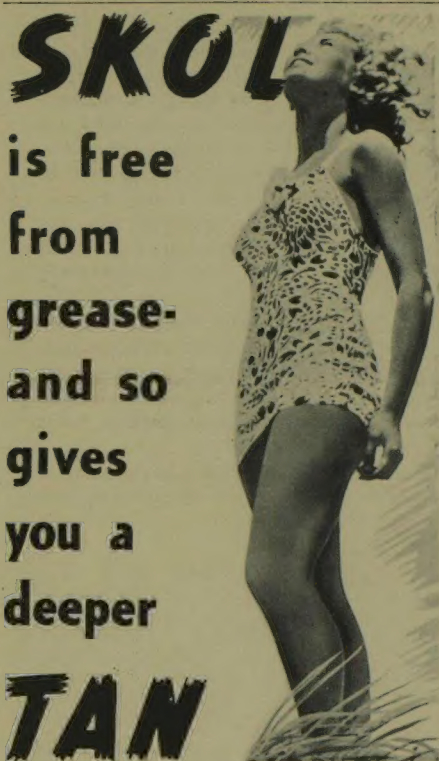
4. WITH A SPECIAL "APPENDIX" AT ONE END FORMING A SEPARATE SHEATH FOR THE LONG, DELICATE PROBOSCIS OF THE FUTURE FULL-GROWN INSECT: A CHRYSALIS OF THE CONVULVULUS HAWK-MOTH.

outwards, so that entrance by enemies from without is barred, while exit is unimpeded. The silken thread which some butterflies pass around the chrysalis case is probably the last remnant of this habit of forming a cocoon.

But some moths form a cocoon of long pieces of stick, bound together lengthwise and recalling the houses built by some caddis-flies. Many such are known, but as yet the name of the builders, so far as I can make out, is unknown. Specimens of such structures from widely different parts of the world have lately been sent to me by some of my readers, and I hope to describe these at no distant date.

Finally, there are some moth-caterpillars which form no cocoon, but burrow down into the ground, to a depth of several inches, and there form a chamber in which to await their resurrection. Two very remarkable examples of this kind are furnished by the convolvulus hawk-moth and the American tomato Sphinx-moth. Remarkable because that most precious and delicate organ, the proboscis, is not bound down to the chrysalis-case, but has a wrapping of its own, standing well away from the case, as is seen in Fig. 4. In these two moths the proboscis is of enormous length and is used for thrusting down long flower-tubes for the sake of the nectar contained there.





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and so  
gives  
you a  
deeper

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"I'm going to send my Mummy to the seaside for a L-O-N-G holiday, because she hasn't had one for years and years—and she works so hard."

"Mummy" can have the joy of a holiday *now*—and return to her home in the slums a new woman—if only you will help. It costs £5 to give two weeks at the sea to a Mother and her 3 children.

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## THE CHRONICLE OF THE CAR.

By H. THORNTON RUTTER.

THE first English factory to produce 1,000,000 cars is Morris Motors, Ltd., of Cowley, Oxford. On May 22 the 1,000,000th car, a 14-h.p. Morris saloon, came off the assembly line and was presented to



BY THE SIDE OF THE BEAUTIFUL LAKE BALA, IN NORTH WALES: THE M.G. 2.6 LITRE. A special feature of this model is the suspension layout, which is designed to give an easy ride at any speed, and to obviate roll on corners.

Captain Eric G. S. Waley, chairman of the Appeals Committee of Guy's Hospital. This hospital is running a competition, with an entrance fee of one shilling, to raise necessary funds—the purchasers of tickets having to give the correct order of the 14 points of the qualities of this 14-h.p. car, and by so doing win it. These fourteen items in their correct order have been handed in a sealed envelope to the Appeals Committee, who will open it to decide who is the winner when the competition closes. It is hoped to sell many thousands of tickets, as it will be a bargain to

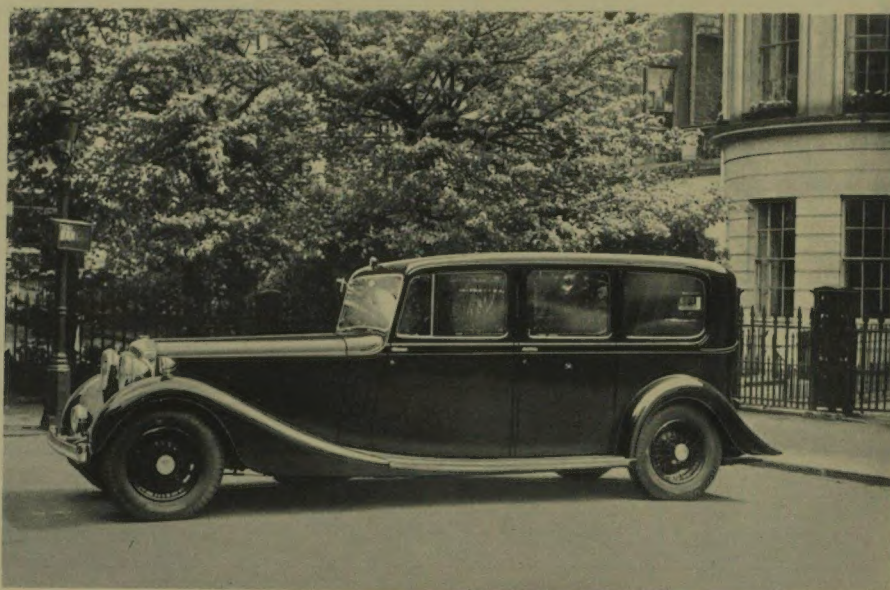
win this car for a shilling. So here's your chance to do a good deed for the hospital and perhaps for yourself.

Last month also saw the 1,000,000th learner-driver pass the driving test instituted by the Ministry of Transport. Failures to pass have exceeded 450,000, but how many of those who first failed afterwards passed the test is not officially stated.

The Government's plan for building a reserve of agricultural tractors in order that it will be possible to expand home production of foodstuffs in case of emergency has pleased many, and especially the Ford Motor Co., Ltd., who have been given the principal contract

d'Endurance 24 hours' race at Le Mans on June 17 and 18. Captain W. O. Bentley, in years gone by, was the first to design cars, built in England, to win that race—the Blue Riband of the sports-car motor world. Now the Lagonda cars are his present design for this famous long-distance race—in fact, the nearest motoring equivalent to the Gold Cup at Ascot. The whole country hopes the Lagondas will repeat the victories of the Bentley cars, which won this event three times. The present touring 42-h.p. twelve-cylinder saloons easily achieve a speed of over 100 m.p.h. on our roads, so with their open streamline sports coachwork and extra-well-tuned engines for this race, no doubt they will far exceed that pace on the special road course at Le Mans, which is kept in good order by the authorities of that district. I understand the cars will have higher gears, too, than normal, so that every ratio is speeded up. Let us hope both cars and their drivers will have good luck and no troubles in this important event. But whether the Lagonda

*[Continued overleaf.]*



RECENTLY SUPPLIED TO THE KING OF GREECE BY MESSRS. STRATSTONE, LTD.: A DAIMLER "STRAIGHT EIGHT" LANDAULETTE, WITH THE EXCEPTIONAL OVERALL LENGTH OF 18 FEET. This Daimler of the King of Greece has a small blue light above the windscreen for identification by the police at night. A shield emblazoned with the royal arms is carried, as is the case with our own State cars.

# WOLSELEY

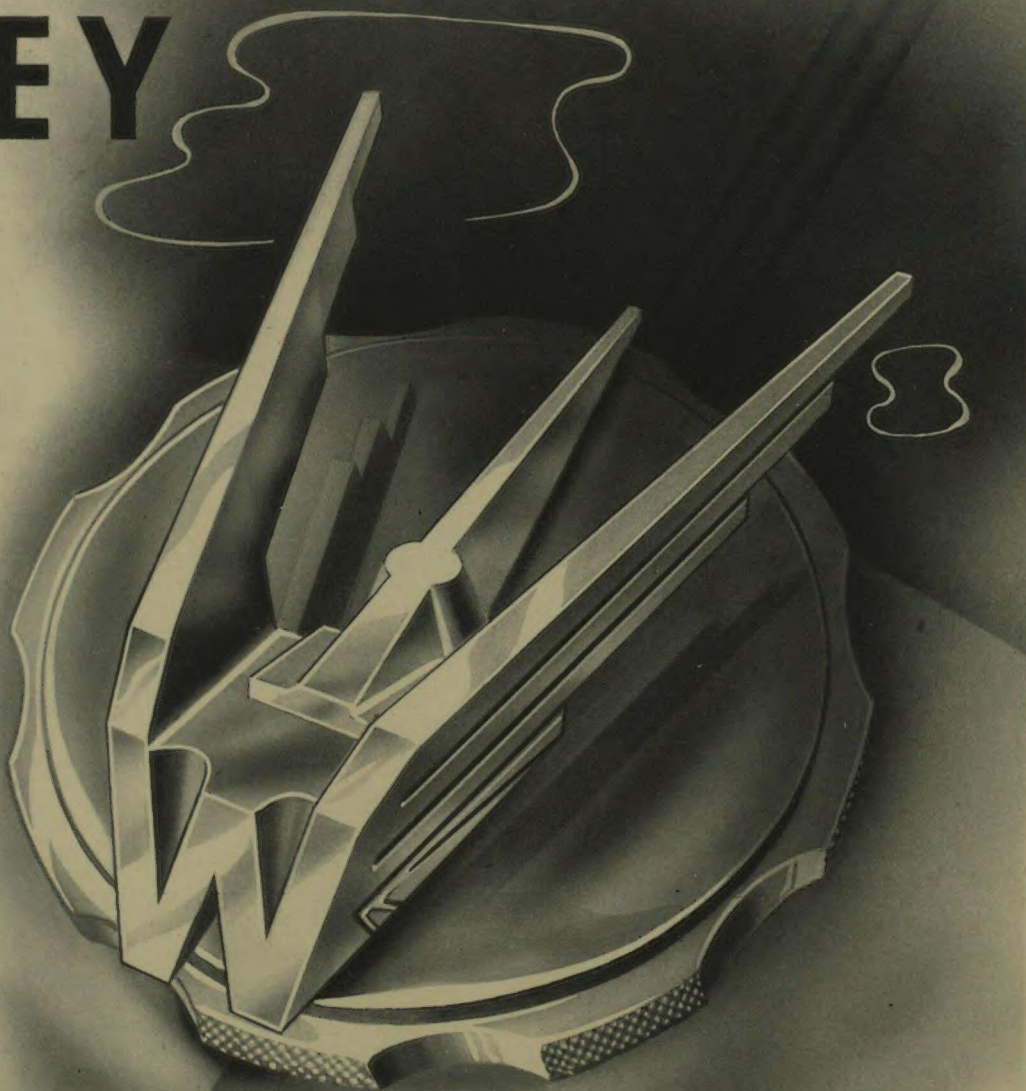
*won its wings*

way back in 1910

**I**F you are ever in the neighbourhood of the Wolseley works it would interest you to visit the Wolseley Museum which abounds in historical exhibits and data.

There are details, for instance, of the Wolseley - engined Voisin biplane which, in 1910 won four prizes (including a "Coupe Archdeacon"! ) by a flight of three kilometres at a height of 107 metres.

The first Wolseley motor car (1898) and the 1900 model which won the first R.A.C. 1,000 miles Reliability Trial, are there—forerunners of the highly successful Wolseley cars of today, one of which this year was awarded the Grand Prix d'Honneur at the Monte Carlo Rally for the third time.





# The Art of the Postage Stamp

By FRED. J. MELVILLE.

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## STAMPS OF THE MOMENT

are not always the best to buy. Topical interest  
in Czechoslovakia, Albania, and so on, does not  
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THIS year's National Exhibition in Zurich has given  
the Swiss Post Office occasion for the issue of four  
denominations of Exhibition stamps in a fanciful design  
by Victor Surbek of William Tell's bow and an apple-tree.



SWITZERLAND:  
THE NATIONAL EXHIBITION AT ZURICH.

The first King Carol  
of Rumania was born in  
1839, son of Prince  
Karl Anton of Hohen-  
zollern Sigmaringen. A  
pictorial outline of his  
life and reign is pre-  
sented on a centenary  
set of fourteen postage  
stamps received from  
Bucharest. The values and a brief description of the  
subjects are: 25 bani, olive-black, Carol driving at head  
of army; 50 b., violet-brown, leading army in the Russo-



FRANCE:  
THE JUBILEE OF THE  
EIFFEL TOWER.

Turkish war, 1877-78; 1 leu, purple,  
offering the crown to Carol, 1881;  
1.50 l., green, Sigmaringen and Peles  
Castles; 2 l., grey-green, Carol with  
his Queen, the royal poetess, "Carmen  
Sylvia"; 3 l., vermilion, Carol at the  
age of six; 4 l., claret, as Major-  
General, 1866; 5 l., grey, as General,  
1877; 7 l., olive-black, equestrian  
statue; 8 l., light-blue, leading cavalry,  
Russo-Turkish war; 10 l., magenta,  
on horseback in later life; 12 l., light  
blue, portrait circa 1914; 15 l., ultra-  
marine, King and Queen, with  
Rumanian shield; 16 l., blue-green,  
mausoleum.

France keeps steadily in the stamp  
news; the familiar figure of the  
Eiffel Tower appears on a large magenta stamp of  
90 centimes issued for the Fêtes of the Jubilee of the  
structure. The stamp, engraved by M. Henri Cheffer,  
is dated June 23, 1939, and  
has been recess-printed at  
the Government stamp  
works.

The Ionian Islands,  
which were in the inter-  
national limelight during  
the Italian coup in Albania  
at Easter, were ceded by  
Britain to Greece just  
seventy-five years ago. In  
1859 three stamps bearing  
Queen Victoria's profile were  
in use under the British régime. These are recalled in  
the designs of three out of five of the stamps issued by  
Greece to mark the seventy-fifth  
anniversary. The 20 drachmas design,  
as illustrated, comes in three colours,  
red, yellow and blue, as in the British  
issue of 1859, but bear, in addition,  
the profile of King George I. of  
Greece. A 1 drachma blue stamp  
bears the Arms of the Seven Islands,  
and a 4 drachmas green presents a  
view of the fortress and port of Corfu.  
Mr. P. J. Drossos, of Athens, tells  
me the three 20 drachma stamps are  
only sold in sets at the post-offices.

From the United States come two  
stamps of strongly contrasted history.  
A 3 cents magenta records the one-  
hundred-and-fiftieth year since the  
inauguration of George Washington as  
the first President. As a miniature engraving it is one  
of the finest examples of the modern work of the Bureau  
of Engraving at Washington.

The contrast is provided  
by an elongated 30 cents blue  
stamp, hurriedly produced, to  
be in time for the first east-  
ward Transatlantic air mail  
service. Letters bearing it  
left New York at 9 a.m.,  
May 20, reached France  
May 22, at 8.30 p.m., and  
London May 23.

As a tribute to medical  
research Danzig presents three  
large stamp portraits of famous  
doctors. They are printed by  
photogravure, the values  
being: 10 pfennig, red-brown,  
Gregor Mendel; 15 p., blue-black, Robert Koch; 25 p.,  
deep olive-green, Wilhelm Konrad Röntgen.



NEWFOUNDLAND: THE ROYAL VISIT  
COMMEMORATED.



GREECE: THE IONIAN ISLANDS  
CEDED 75 YEARS AGO.



U.S.A.:  
GEORGE WASHINGTON  
AS FIRST PRESIDENT.



DANZIG: WILHELM KONRAD  
RÖNTGEN.

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World's finest collection of this country, offered in a sale of over  
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Continued.]

team furnishes the winner or not, I am sure their display will be a convincing proof that Britain can build high-class cars which are both fast and comfortable to ride in—two factors which discriminating buyers desire in their carriages.



ONE OF THE MOST POPULAR 10-H.P. CARS: THE HILLMAN "MINX" COUPÉ WHICH IS MUCH FAVOURED BY THE EVER-GROWING NUMBER OF MOTORISTS WHO REQUIRE A CAR THAT WILL SUIT EVERY KIND OF WEATHER CONDITION. The "Minx" Foursome drop-head coupé seats four persons in comfort, has good luggage accommodation, and when closed is an entirely weatherproof car. The roof opens either fully or to a mid-way position. The car is moderately priced at £210.

Demand for our high-class motor-carriages both at home and abroad has enabled the Daimler Company to reduce the list price of their 24-h.p. models by some £75 to £80, according to the style of the coachwork, which is rather a wonderful piece of news at a time when prices are apt to be increased rather than lowered. Also, Humbers have their works kept going at full rate in order to try and overtake the list of orders for immediate delivery. Humber "Snipe" models are very popular these days, which is not surprising when you view their imposing appearance, further enhanced by an excellent road performance.

Coventry is pushing on production of cars in all the factories there, so that when the town has its "holidays-with-pay" in September everyone can go

away knowing that the order-book demands are completed. The firms have arranged their holidays so that all close down at the same time and reopen again together.

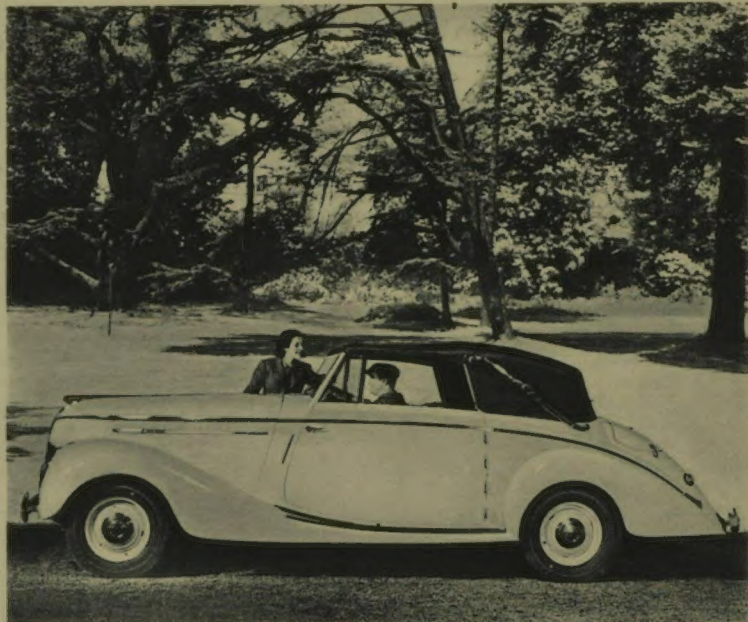
Derby has only Rolls-Royce and Bentley to look after, as far as cars are concerned, and those firms have usually taken the August Bank Holiday week as their closing time, so I expect they will do this again. Why I refer to it at all is because now is the time to buy your Bentley car before the date gets too near, otherwise you may be disappointed in getting as early delivery as you may wish. Bentleys are just wonderful this year, a regular vintage production, as wine merchants would say. Also, their present coupé coachwork is ideal, whether built by Barker, Park Ward, or Hooper, as the designs are very smart, with a sporting appearance, yet have all the seating comfort of a stately limousine. I know of no car which better satisfies both driver and passengers. The driver has the same joy in handling the wheel as one gets riding a thoroughbred horse, while the passenger

receives the same comfortable satisfaction, whether the hood or top is entirely open, closed or half-way open, as draughts can be excluded, while admitting ample fresh air.

Major Gardner has written all about his previous 200 m.p.h. (nearly) record made on his racing M.G. "Magnette," in a booklet, available at all M.G. dealers or from the works at Abingdon, Berks. It is most interesting reading, and is a shining example of what the modern British motor-car can do when Lord Nuffield's chief engineers

seek to beat the world's best and succeed. The experience gained from racing has given all the M.G. models that distinctive characteristic which delights a real good driver; and also the passengers, as M.G. cars can tackle rough mountain tracks as easily as they do smooth modern highways, because racing showed designers how to give efficient suspension over both kinds of surfaces, good and bad.

Nowadays motorists desire a good road performance, but unless this can be obtained with ease and comfort for all the passengers it cannot be acceptable. M.G. cars, whether the 10-h.p. "Midget," the 12-h.p. M.G. "Magnette" 1½-litre, the six-cylinder 18-h.p. 2-litre, or the six-cylinder 20-h.p. 2½-litre, provide both those virtues—quickness with comfort—so that when the foot does depress the accelerator the engine immediately responds, and the passengers are comfortable, whether travelling fast or slowly. So buy an M.G. and you are sure to get satisfaction, whatever the model.



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**Le Touquet—Hotel des Anglais**—In forest adjoining Casino. Every possible comfort. Large park. Own bus to Golf and Sea. Moderate.

**Le Touquet—Hotel Carlton**—Garden, tennis, latest comf. Excellent situation. On Beach. Inclusive from 95 Francs. August from 125 Francs.

**Le Touquet—(P. de C.)—Golf Hotel**—Facing Links. New Lounge and American Bar. Special privilege of daily green free.

**Le Touquet—Hotel Regina**—Facing Sea. Opp. Swimming-pool. First-class residential hotel. Attractive inclusive rates.

**Monte Carlo—Le Grand Hotel**—350 rooms, 280 bathrooms. Entirely renovated. Open all the year. Central. Opposite New Sporting Club.

### GERMANY

**Baden-Baden—Hotel Frankfurter Hof**—Wholly Renovated. Facing Kurpark; a home from home. Manager's wife English. Prices moderate.

**Baden-Baden (Black Forest)—Brenner's Park-hotel**—Family Hotel de Luxe.

**Bad Gastein—Grand Hotel Gasteinerhof**—Sunnier hotel. First class. 180 beds. Pen. from R.M. 9.50. Patronised by English Society. Open in winter too.

**Bad Gastein—Parkhotel Bellevue**—The house of international society—360 beds. £1 a day.

**Bad Gastein—Hotel Straubinger**—1st-class family hotel. 200 rooms. Thermal-bath in hotel, garage. Pension from R.M. 10 upwards.

**Bad Nauheim—Jeschke's Grand Hotel**—The home of the discriminating client.

**Bad Nauheim—Der Kaiserhof**—First-class hotel. Large garden, facing baths and Kurpark. 150 rooms, 50 baths. Pension from R.M. 11.

**Cologne—Schweizerhof, Victoriastr.** 11—100 beds, all mod. comf., garage, AA Hotel, quiet situation, home from home. Inclusive terms from R.M. 7.00.

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### GERMANY—(Continued)

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**Warsaw—Hotel Bristol**—250 rooms. Every modern comfort. 90 private bathrooms. Garage. Restaurant. Dancing. Cocktail-Bar. Garden.

## CONTINENTAL HOTELS—(Continued)

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**Davos—Palace Hotel**—Summer 1939. Rooms from Frs. 6. Full board from Frs. 15. With Parsenn Railway on 8,000 feet.

**Geneva—Hotel de la Paix**—On Lake facing Mont-Banc. Close to pier and places of interest. Lovely rooms fr. S.Frs. 6. With full board S.Frs. 14.

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**Gstaad—Bernerhof**—Typical Swiss Hotel in Bernese Oberland. Noted for food and comfort. Golf. Tennis. Swimming. Terms from Frs. 11.

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### SWITZERLAND—(Continued)

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